

RF TEST REPORT



Report No.: FCC_RF_SL14091001-RUC-017A2 Rev 2.0

Supersede Report No.: FCC_RF_SL14091001-RUC-017A2 Rev 1.0

Applicant	:	Ruckus Wireless, Inc.
Product Name	:	Wireless Bridge
Model No.	:	P300
Test Standard	:	47 CFR 15.407
Test Method	:	ANSI C63.10: 2013 789033 D02 General UNII Test Procedures New Rules v01
FCC ID	:	S9GP300
IC ID	:	5912A-P300
Dates of test	:	05/20/2015 to 05/21/2015
Issue Date	:	07/28/2015
Test Result	:	☒ Pass ☐ Fail
Equipment complied with the specification ☒		
Equipment did not comply with the specification ☐		

This Test Report is Issued Under the Authority of:	
	
Ricky Wang	David Zhang
Test Engineer	Engineer Reviewer
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Issued By:
SIEMIC Laboratories
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Laboratory Introduction

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Accreditations for Conformity Assessment

Country/Region	Accreditation Body	Scope
USA	FCC, A2LA	EMC, RF/Wireless, Telecom
Canada	IC, A2LA, NIST	EMC, RF/Wireless, Telecom
Taiwan	BSMI, NCC, NIST	EMC, RF, Telecom, Safety
Hong Kong	OFTA, NIST	RF/Wireless, Telecom
Australia	NATA, NIST	EMC, RF, Telecom, Safety
Korea	KCC/RRR, NIST	EMI, EMS, RF, Telecom, Safety
Japan	VCCI, JATE, TELEC, RFT	EMI, RF/Wireless, Telecom
Mexico	NOM, COFETEL, Caniety	Safety, EMC, RF/Wireless, Telecom
Europe	A2LA, NIST	EMC, RF, Telecom, Safety
Israel	MOC, NIST	EMC, RF, Telecom, Safety

Accreditations for Product Certifications

Country	Accreditation Body	Scope
USA	FCC TCB, NIST	EMC, RF, Telecom
Canada	IC FCB, NIST	EMC, RF, Telecom
Singapore	iDA, NIST	EMC, RF, Telecom
EU	NB	EMC & R&TTE Directive
Japan	MIC (RCB 208)	RF, Telecom
Hong Kong	OFTA (US002)	RF, Telecom

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1 Report Revision History

Report No.	Report Version	Description	Issue Date
FCC_RF_SL14091001-RUC-017A2	None	Original	05/21/2015
FCC_RF_SL14091001-RUC-017A2 Rev 1.0	Rev 1.0	Updated antenna information	07/06/2015
FCC_RF_SL14091001-RUC-017A2 Rev 2.0	Rev 2.0	Updated test summary	07/28/2015

2 Executive Summary

The purpose of this test program was to demonstrate compliance of following product

Company: Ruckus Wireless, Inc.
Product: Wireless Bridge
Model: P300

against the current Stipulated Standards. This report does not demonstrate the specified model product to be fully compliance with Stipulated Standard listed on 1st page. It contains additional test data for the EUT operating under Point-to-Multipoint operation mode and need to cross reference with original FCC test report to be demonstrated fully compliance with FCC rules. Reference to original FCC test report number: FCC_RF_SL14091001-RUC-017_UNII Rev3.0

3 Customer information

Applicant Name	:	Ruckus Wireless, Inc.
Applicant Address	:	350 West Java Drive, Sunnyvale, California 94089 U.S.A
Manufacturer Name	:	Ruckus Wireless, Inc.
Manufacturer Address	:	350 West Java Drive, Sunnyvale, California 94089 U.S.A

4 Test site information

Lab performing tests	SIEMIC Laboratories
Lab Address	775 Montague Expressway, Milpitas, CA 95035
FCC Test Site No.	881796
IC Test Site No.	4842D-2
VCCI Test Site No.	A0133

5 Modification

Index	Item	Description	Note
-	-	-	-

6 EUT Information

6.1 EUT Description

Product Name	:	Wireless Bridge
Model No.	:	P300
Trade Name	:	Ruckus
Serial No.	:	111573903705
Host Model No.	:	N/A
Input Power	:	48VDC (PoE)
Power Adapter Manu/Model	:	N/A
Power Adapter SN	:	N/A
Date of EUT received	:	03/25/2015
Equipment Class/ Category	:	UNII
Clock Frequencies	:	N/A
Port/Connectors	:	PoE, Ethernet

6.2 Radio Description

Radio Type	802.11a	802.11n-HT20	802.11n-HT40	802.11ac
Operating Frequency	5180-5240MHz 5745-5825MHz	5180-5240MHz 5745-5825MHz	5190-5230MHz 5755-5795MHz	5210MHz 5775MHz
Modulation	OFDM (BPSK, QPSK, 16QAM, 64QAM)	OFDM (BPSK, QPSK, 16QAM, 64QAM)	OFDM (BPSK, QPSK, 16QAM, 64QAM)	OFDM (BPSK, QPSK, 16QAM, 64QAM)
Channel Spacing	20MHz	20MHz	40MHz	80MHz
Number of Channels	9	9	5	2
Antenna Type	Internal Antenna/External Antenna			
Antenna Gain (Peak)	Internal:14dBi External1:21dBi External2:24dBi			
Antenna Connector Type	Internal_14dBi: U.FL External1_21dBi: N-Type External2_24dBi: N-Type			
Note	EUT has 3 antenna sets , 1internal antenna with 14dBi gain, 1 external antenna with 21dBi gain and 1 external antenna with 24dBi gain. All antennas are dual polarized directional antennas. 3 anrennas shall be used separately.			

EUT Power Level Settings

Band	Mode	Frequency	14dBi antenna	21dBi antenna	24dBi antenna
5.2GHz	802.11-a	5180	22	15	12
		5200	22	15	12
		5240	22	15	12
	802.11n-HT20	5180	22	15	13
		5200	22	15	13
		5240	22	15	12
	802.11n-HT40	5190	20	18	15
		5230	22	18	15
	802.11ac	5210	18	14	8
5.8GHz	802.11-a	5745	22	18	14
		5785	22	17	14
		5825	22	18	15
	802.11n-HT20	5745	22	18	15
		5785	22	17	14
		5825	22	18	15
	802.11n-HT40	5755	22	18	15
		5795	22	17	14
	802.11ac	5775	21	13	14

7 Supporting Equipment/Software and cabling Description

7.1 Supporting Equipment

Item	Supporting Equipment Description	Model	Serial Number	Manufacturer	Note
1	Laptop	PP01L Latitude E5440	F1WPF12	Dell	-
2	POE Adapter	740-64157-001	133279963	Ruckus	-

7.2 Cabling Description

Name	Connection Start		Connection Stop		Length / shielding Info		Note
	From	I/O Port	To	I/O Port	Length (m)	Shielding	
RJ45	EUT	RJ45	POE	RJ45	2	Unshielded	-
RJ45	POE	RJ45	Laptop	RJ45	3	Unshielded	-

7.3 Test Software Description

Test Item	Software	Description
RF Testing	Command Line in windows	Set the EUT to transmit continuously in diferent test modes and channels

8 Test Summary

Test Item	Test standard		Test Method/Procedure	Pass / Fail
Restricted Band of Operation	FCC	15.205	ANSI C63.10: 2013 789033 D02 General UNII Test Procedures New Rules v01	☐ Pass ☒ N/A
AC Conducted Emissions Voltage	FCC	15.207(a)	ANSI C63.10: 2013	☐ Pass ☒ N/A

Test Item	Test standard		Test Method/Procedure	Pass / Fail
26 & 6 dB Emission Bandwidth	FCC	15.407 (a) (2)	789033 D02 General UNII Test Procedures New Rules v01	☐ Pass ☒ N/A
Maximum conducted Output Power	FCC	15.407 (a) (2)	789033 D02 General UNII Test Procedures New Rules v01	☒ Pass ☐ N/A
Power reduction (Antenna Gain > 6 dBi)	FCC	15.407 (a) (2)	-	☒ Pass ☐ N/A
Band Edge and Radiated Spurious Emissions	FCC	15.407(b)(2), 15.407(b)(6)	ANSI C63.10: 2013 789033 D02 General UNII Test Procedures New Rules v01	☐ Pass ☒ N/A
Power Spectral Density	FCC	15.407 (a) (2)	789033 D02 General UNII Test Procedures New Rules v01	☒ Pass ☐ N/A
Frequency Stability	FCC	15.407 (g)	-	☐ Pass ☒ N/A
Transmit Power Control (TPC)	FCC	15.407 (h)(1)	-	☐ Pass ☒ N/A
User Manual	FCC	-	-	☒ Pass ☐ N/A

Remark	- All measurement uncertainties are not taken into consideration for all presented test result. - The applicant shall ensure frequency stability by showing that an emission is maintained within the band of operation under all normal operating conditions as specified in the user's manual. - Current report only contains additional test data for the EUT operating under Point-to-Multipoint operation mode. For complete test data, please reference to original FCC test report. - N/A: Refer to reports FCC_RF_SL14091001-RUC-017A1_UNII and FCC_RF_SL14091001-RUC-017_UNII.
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9 Measurement Uncertainty

Emissions			
Test Item	Frequency Range	Description	Uncertainty
Band Edge and Radiated Spurious Emissions	30MHz – 1GHz	Confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2 (for EUTs < 0.5m X 0.5m X 0.5m)	+5.6dB/-4.5dB
Band Edge and Radiated Spurious Emissions	1GHz – 40GHz	Confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2 (for EUTs < 0.5m X 0.5m X 0.5m)	+4.3dB/-4.1dB

10 Measurements, Examination and Derived Results

10.1 Peak Output Power

Requirement(s):

Spec	Item	Requirement	Applicable
§ 15.407	a)(1)(i)	For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).	☒
	a)(1)(ii)	For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi.	☐
	a)(1)(iii)	For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi.	☐
	a)(1)(iv)	For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi.	☐
	a)(2)	For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm 10 log B, where B is the 26 dB emission bandwidth in megahertz.	☐
	a)(3)	For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.	☒

Test Setup			
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Test Procedure	789033 D02 General UNII Test Procedures New Rules v01 <u>Measurement using a Power Meter (PM)</u> Measurements may be performed using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required. - Connect EUT's RF output power to power meter - Set EUT to be continuous transmission mode - Measurement the average output power using power meter and record the result - Repeat above steps for different test channel and other modulation type.		
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Test Date	05/20/2015	Environmental condition	Temperature 21°C Relative Humidity 40% Atmospheric Pressure 1019mbar
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Remark	Per KDB 662911 D01 Multiple Transmitter Output v02r01, the direction gain for horizontal polarization and vertical polarization is calculated separately. EUT is using cross-polarized antenna, thus the array gain is 0, and directional gain = highest individual gain of both polarization antenna, so the directional gain will be either 14 dBi, 21 dBi or 24 dBi. For 5.15-5.25 GHz Band and 5.725-5.85 GHz, the transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.		
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Result	☒ Pass ☐ Fail		
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Test Data ☒ Yes ☐ N/A

Test Plot ☐ Yes (See below) ☒ N/A

Output Power measurement result for 5.2GHz

Antenna Type	Test mode	Freq (MHz)	CH	Conducted Power (dBm)			Limit (dBm)	Result
				Chain1	Chain2	Combined Power		
14dBi	802.11a	5180	Low	15.94	16.09	16.09	22	Pass
		5200	Mid	16.11	16.09	16.11	22	Pass
		5240	High	15.79	15.76	15.79	22	Pass
	802.11n-HT20	5180	Low	15.85	15.95	18.91	22	Pass
		5200	Mid	16.04	16.00	19.03	22	Pass
		5240	High	15.70	15.58	18.65	22	Pass
	802.11n-HT40	5190	Low	13.13	13.51	16.33	22	Pass
		5230	Mid	14.86	15.43	18.16	22	Pass
	802.11ac	5210	High	10.79	10.85	13.83	22	Pass
21dBi	802.11a	5180	Low	8.87	9.13	9.13	15	Pass
		5200	Mid	9.29	9.34	9.34	15	Pass
		5240	High	9.46	9.12	9.46	15	Pass
	802.11n-HT20	5180	Low	8.98	9.19	12.10	15	Pass
		5200	Mid	9.36	9.30	12.34	15	Pass
		5240	High	9.62	9.04	12.35	15	Pass
	802.11n-HT40	5190	Low	11.07	11.57	14.34	15	Pass
		5230	High	11.84	11.40	14.64	15	Pass
	802.11ac	5210	High	6.80	7.06	9.94	15	Pass
24dBi	802.11a	5180	Low	5.89	6.22	6.22	12	Pass
		5200	Mid	6.29	6.02	6.29	12	Pass
		5240	High	6.00	6.52	6.52	12	Pass
	802.11n-HT20	5180	Low	6.76	7.06	9.92	12	Pass
		5200	Mid	7.13	7.20	10.18	12	Pass
		5240	High	6.46	5.88	9.19	12	Pass
	802.11n-HT40	5190	Low	8.59	8.67	11.64	12	Pass
		5230	High	8.99	8.59	11.80	12	Pass
	802.11ac	5210	High	0.66	0.92	3.80	12	Pass

Output Power Measurement Results for 5.8GHz

Antenna Type	Test mode	Freq (MHz)	CH	Conducted Power (dBm)			Limit (dBm)	Result
				Chain1	Chain2	Combined/Highest Power		
14dBi	802.11a	5745	Low	15.31	14.99	15.31	22	Pass
		5785	Mid	15.48	15.04	15.48	22	Pass
		5825	High	15.69	14.75	15.69	22	Pass
	802.11n-HT20	5745	Low	15.25	15.05	18.16	22	Pass
		5785	Mid	15.45	14.88	18.18	22	Pass
		5825	High	15.66	14.73	18.23	22	Pass
	802.11n-HT40	5755	Low	15.19	14.84	18.03	22	Pass
		5795	Mid	16.12	14.88	18.55	22	Pass
	802.11ac	5775	High	14.62	16.72	18.81	22	Pass
21dBi	802.11a	5745	Low	11.96	11.75	11.96	15	Pass
		5785	Mid	11.24	11.15	11.24	15	Pass
		5825	High	11.56	11.42	11.56	15	Pass
	802.11n-HT20	5745	Low	11.85	11.75	14.81	15	Pass
		5785	Mid	11.19	11.11	14.16	15	Pass
		5825	High	11.55	11.56	14.57	15	Pass
	802.11n-HT40	5755	Low	11.19	11.95	14.60	15	Pass
		5795	Mid	10.30	11.36	13.87	15	Pass
	802.11ac	5775	High	5.94	5.70	8.83	15	Pass
24dBi	802.11a	5745	Low	8.20	7.86	8.20	12	Pass
		5785	Mid	8.53	8.27	8.53	12	Pass
		5825	High	8.78	8.79	8.79	12	Pass
	802.11n-HT20	5745	Low	8.98	8.74	11.87	12	Pass
		5785	Mid	8.36	8.13	11.26	12	Pass
		5825	High	8.77	8.70	11.75	12	Pass
	802.11n-HT40	5755	Low	8.10	8.88	11.52	12	Pass
		5795	Mid	7.08	8.55	10.89	12	Pass
	802.11ac	5775	High	7.01	6.76	9.90	12	Pass

10.2 Peak Spectral Density

Requirement(s):

Spec	Item	Requirement	Applicable
§ 15.407	a)(1)(i)	For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band.	☒
	a)(1)(ii)	For an indoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band.	☐
	a)(2)	For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band.	☐
	a)(3)	For the band 5.725-5.85 GHz, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band.	☒
Test Setup			
Test Procedure	789033 D02 General UNII Test Procedures New Rules v01, II.F. Method SA-1 <u>Maximum spectral density measurement procedure</u> - Set span to encompass the entire emission bandwidth (EBW) (or, alternatively, the entire 99% occupied bandwidth) of the signal. - Set RBW = 1 MHz - Set VBW ≥ 3 MHz - Detector = RMS. - Sweep time = auto couple. - Trace mode = max hold. - Trace average at least 100 traces in power averaging - Use the peak marker function to determine the maximum amplitude level within the RBW. Apply correction to the result if different RBW is used.		
Test Date	05/20/2015	Environmental condition	Temperature 22°C Relative Humidity 42% Atmospheric Pressure 1020mbar
Remark	Per KDB 662911 D01 Multiple Transmitter Output v02r01, the direction gain for horizontal polarization and vertical polarization is calculated separately. EUT is using cross-polarized antenna, thus the array gain is 0, and directional gain = highest individual gain of both polarization antenna, so the directional gain will be either 14 dBi, 21 dBi or 24 dBi. For 5.15-5.25 GHz Band and 5.725-5.85 GHz, the transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.		
Result	☒ Pass ☐ Fail		

Equipment Setting

Test	RBW	VBW	Span	Detector	Sweep	Trace	Notes
PSD	1MHz	≥3MHz	>EBW	RMS	Auto	Average	-

Test Data ☒ Yes ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

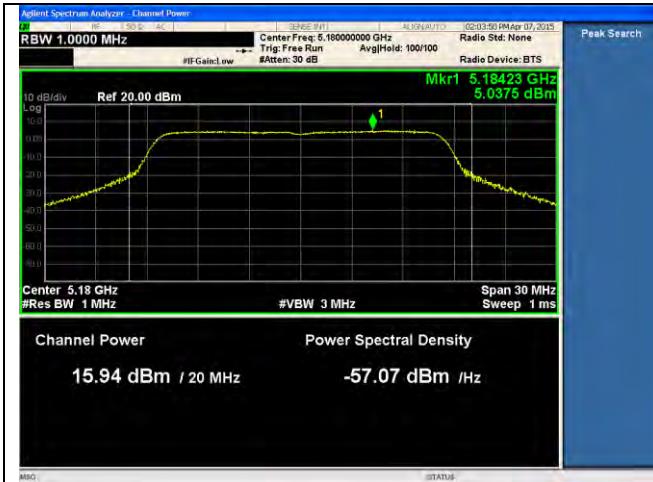
PSD measurement result for 5.2GHz

Antenna Type	Test mode	Freq (MHz)	CH	Conducted PSD (dBm)			Limit (dBm/MHz)	Result
				Chain1	Chain2	Combined/highest PSD		
14dBi	802.11a	5180	Low	5.04	5.15	5.15	9	Pass
		5200	Mid	5.09	4.95	5.09	9	Pass
		5240	High	4.86	4.73	4.86	9	Pass
	802.11n-HT20	5180	Low	4.55	5.03	7.81	9	Pass
		5200	Mid	4.76	4.70	7.74	9	Pass
		5240	High	4.35	4.10	7.24	9	Pass
	802.11n-HT40	5190	Low	-1.18	-0.72	2.07	9	Pass
		5230	Mid	0.35	0.95	3.67	9	Pass
	802.11ac	5210	High	-6.45	-6.50	-3.46	9	Pass
21dBi	802.11a	5180	Low	-2.05	-1.74	-1.74	2	Pass
		5200	Mid	-1.88	-1.62	-1.62	2	Pass
		5240	High	-1.68	-1.84	-1.68	2	Pass
	802.11n-HT20	5180	Low	-2.06	-1.99	0.99	2	Pass
		5200	Mid	-2.09	-1.97	0.98	2	Pass
		5240	High	-1.77	-2.26	1.00	2	Pass
	802.11n-HT40	5190	Low	-2.80	-2.46	0.38	2	Pass
		5230	Mid	-2.45	-2.74	0.42	2	Pass
	802.11ac	5210	High	-10.63	-10.39	-7.50	2	Pass
24dBi	802.11a	5180	Low	-4.97	-4.77	-4.77	-1	Pass
		5200	Mid	-4.84	-4.92	-4.84	-1	Pass
		5240	High	-4.98	-4.53	-4.53	-1	Pass
	802.11n-HT20	5180	Low	-4.39	-4.18	-1.27	-1	Pass
		5200	Mid	-4.28	-4.13	-1.19	-1	Pass
		5240	High	-4.83	-5.35	-2.07	-1	Pass
	802.11n-HT40	5190	Low	-5.79	-5.41	-2.59	-1	Pass
		5230	Mid	-5.00	-5.41	-2.19	-1	Pass
	802.11ac	5210	High	-15.79	-16.04	-12.90	-1	Pass

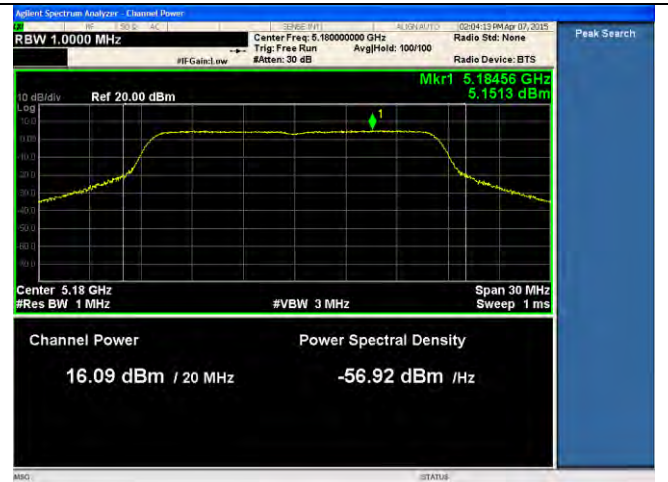
PSD measurement result for 5.8GHz

Antenna Type	Test mode	Freq (MHz)	CH	Conducted PSD (dBm/MHz)			Combined PSD	Limit (dBm/MHz)	Result
				Chain1	Chain2	correction factor (dB)			
14dBi	802.11a	5745	Low	3.24	2.51	6.99	10.23	22	Pass
		5785	Mid	1.84	2.65	6.99	9.64	22	Pass
		5825	High	1.63	1.63	6.99	8.62	22	Pass
	802.11n-HT20	5745	Low	2.19	2.15	6.99	12.17	22	Pass
		5785	Mid	3.20	3.01	6.99	13.11	22	Pass
		5825	High	0.95	1.78	6.99	11.38	22	Pass
	802.11n-HT40	5755	Low	-1.91	-1.38	6.99	8.36	22	Pass
		5795	High	-1.41	-2.27	6.99	8.18	22	Pass
	802.11ac	5775	Mid	-5.93	-7.37	6.99	3.41	22	Pass
21dBi	802.11a	5745	Low	-2.66	-2.29	6.99	4.7	15	Pass
		5785	Mid	-3.88	-2.93	6.99	4.06	15	Pass
		5825	High	-2.94	-2.87	6.99	4.12	15	Pass
	802.11n-HT20	5745	Low	-2.92	-3.39	6.99	6.85	15	Pass
		5785	Mid	-3.42	-2.07	6.99	7.31	15	Pass
		5825	High	-1.58	-1.54	6.99	8.44	15	Pass
	802.11n-HT40	5755	Low	-7.02	-5.21	6.99	3.98	15	Pass
		5795	High	-6.82	-5.66	6.99	3.80	15	Pass
	802.11ac	5775	Mid	-15.01	-16.05	6.99	-5.50	15	Pass
24dBi	802.11a	5745	Low	-6.75	-5.86	6.99	1.13	12	Pass
		5785	Mid	-6.59	-6.08	6.99	0.91	12	Pass
		5825	High	-6.05	-6.13	6.99	0.94	12	Pass
	802.11n-HT20	5745	Low	-5.94	-6.56	6.99	3.76	12	Pass
		5785	Mid	-7.28	-6.54	6.99	3.11	12	Pass
		5825	High	-5.29	-6.41	6.99	4.19	12	Pass
	802.11n-HT40	5755	Low	-9.63	-7.88	6.99	1.33	12	Pass
		5795	High	-9.83	-10.15	6.99	0.01	12	Pass
	802.11ac	5775	Mid	-13.95	-14.58	6.99	-4.25	12	Pass
Note	BW correction factor = 10log(500kHz/RBW)								

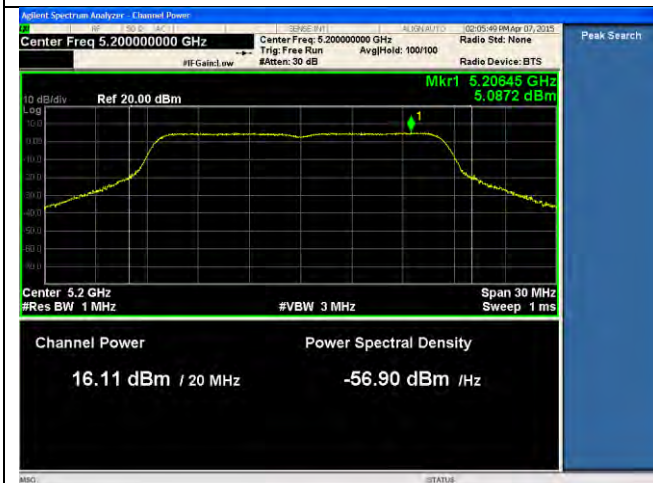
Test Plots



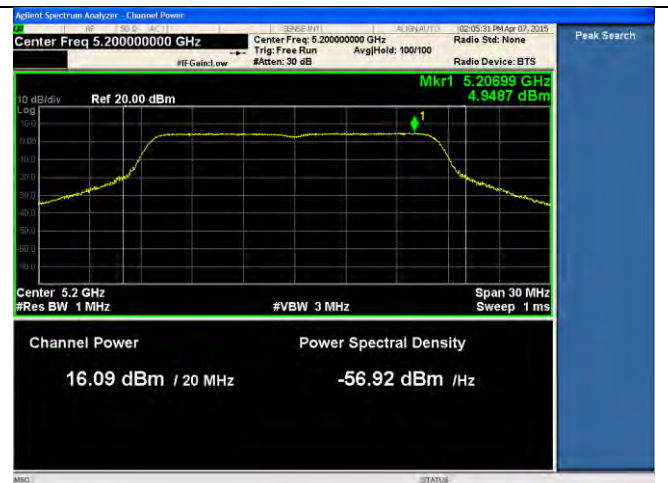
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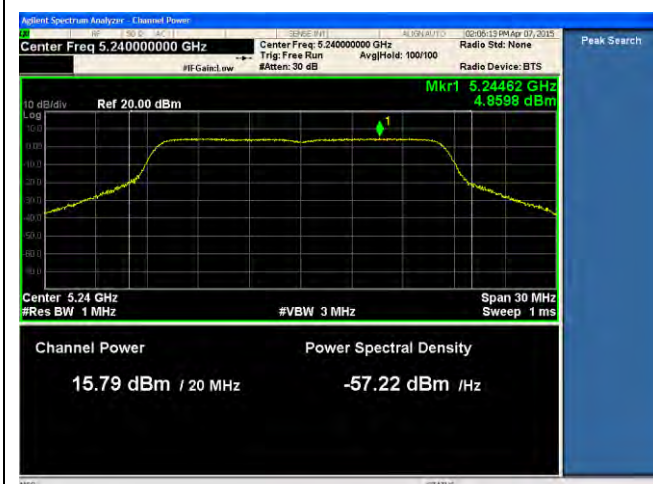
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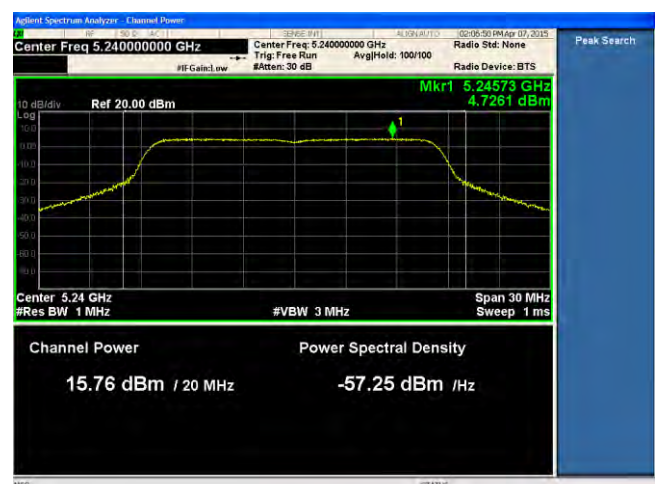
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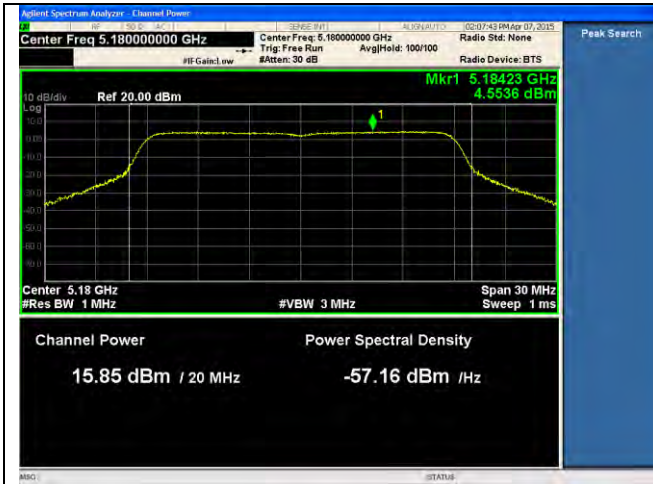
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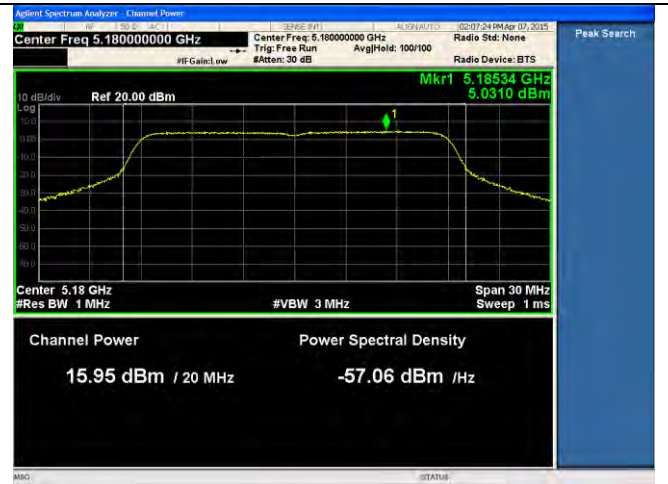
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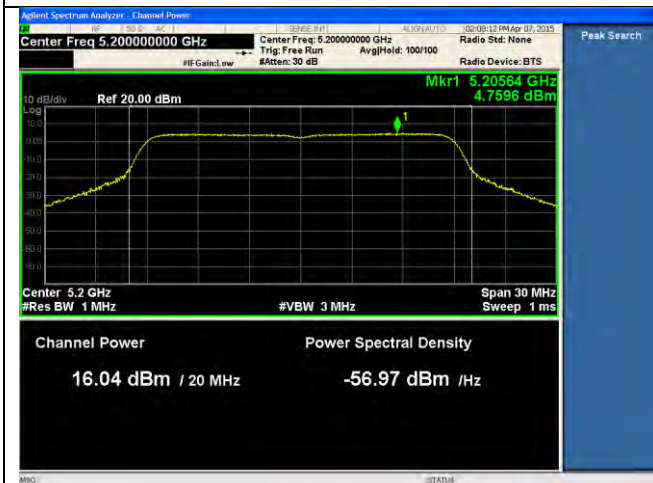
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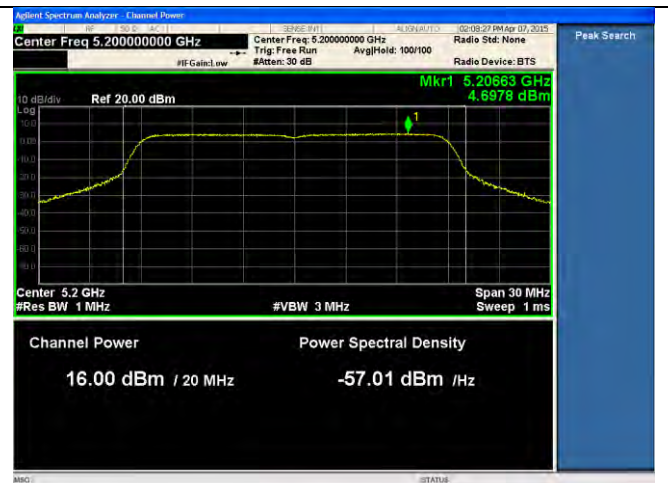
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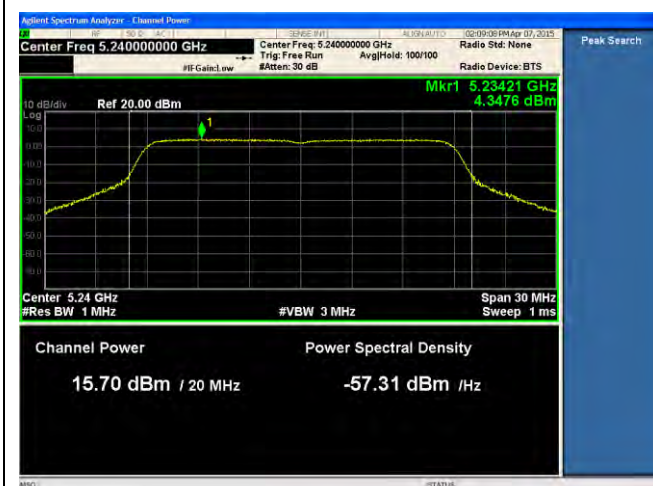
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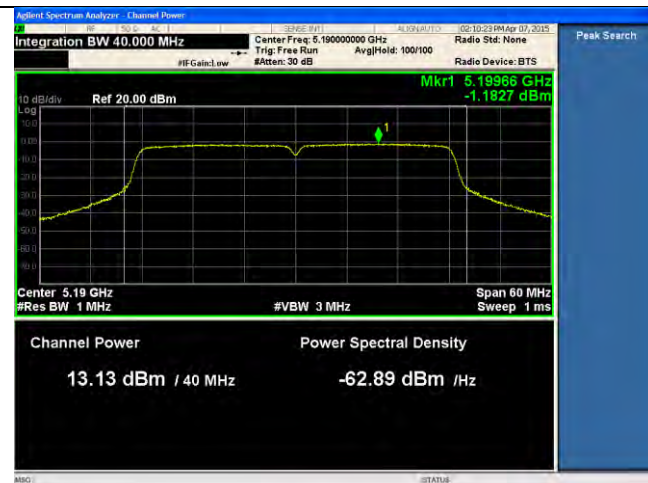
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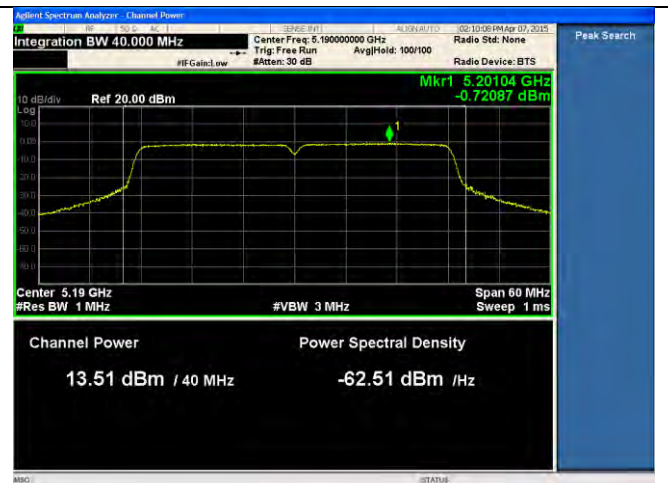
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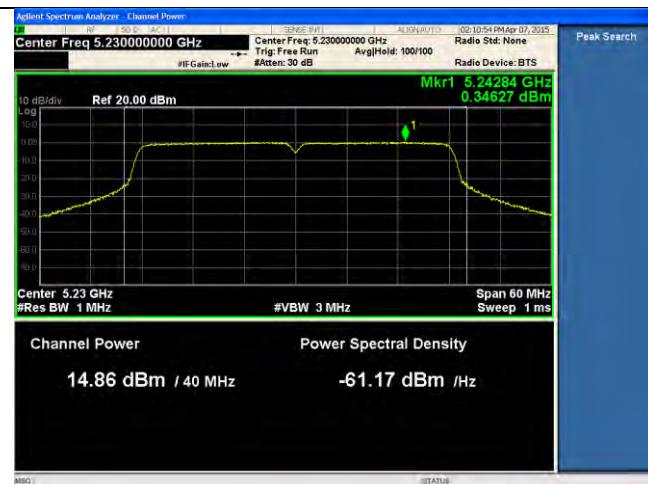
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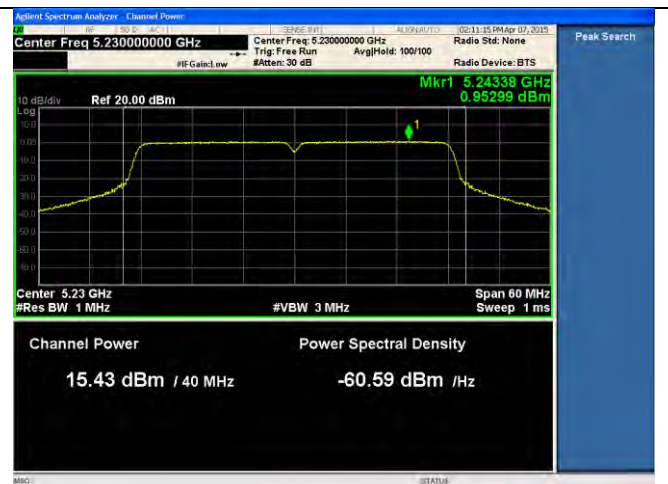
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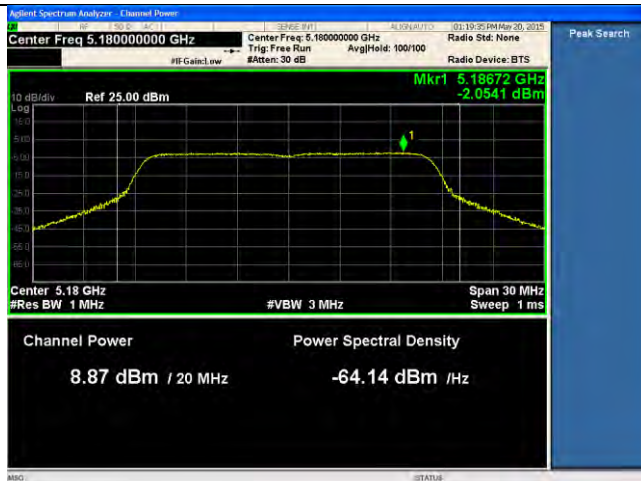
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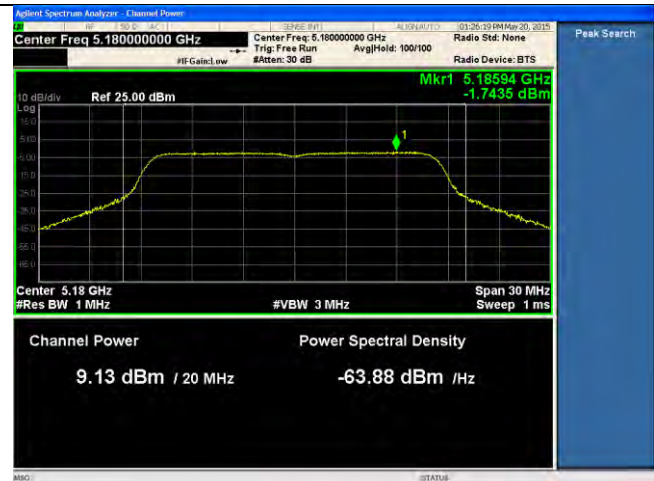
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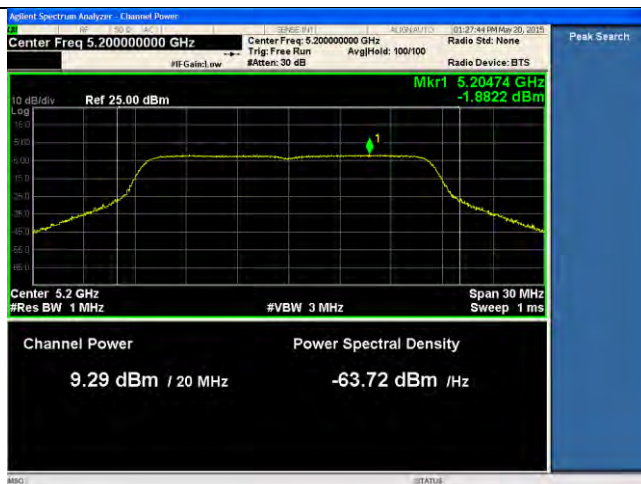
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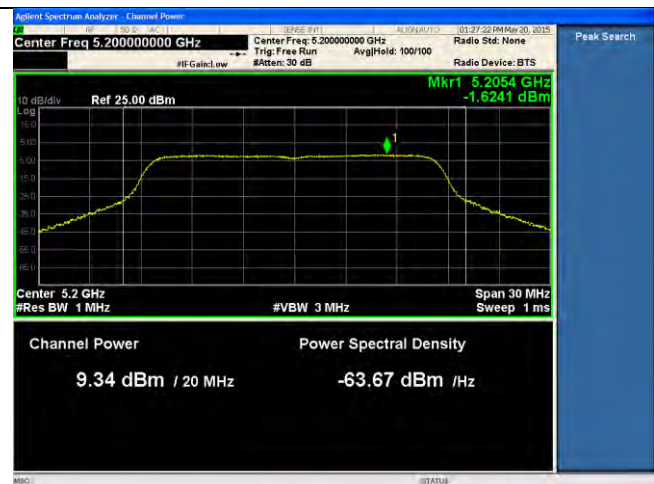
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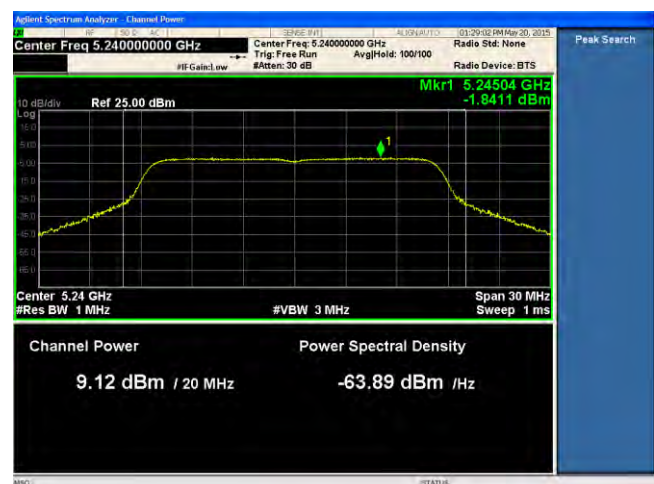
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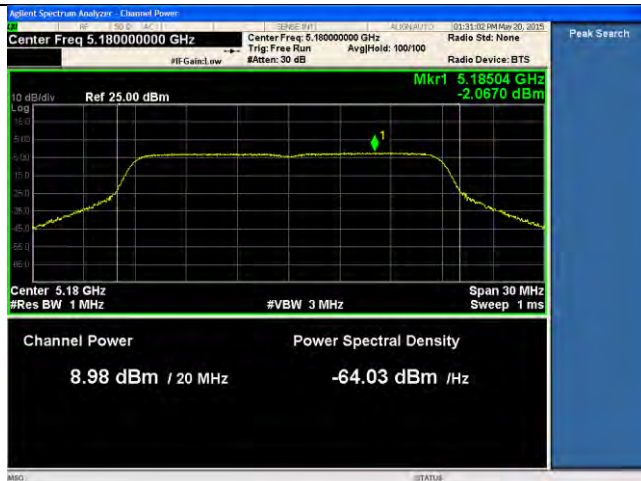
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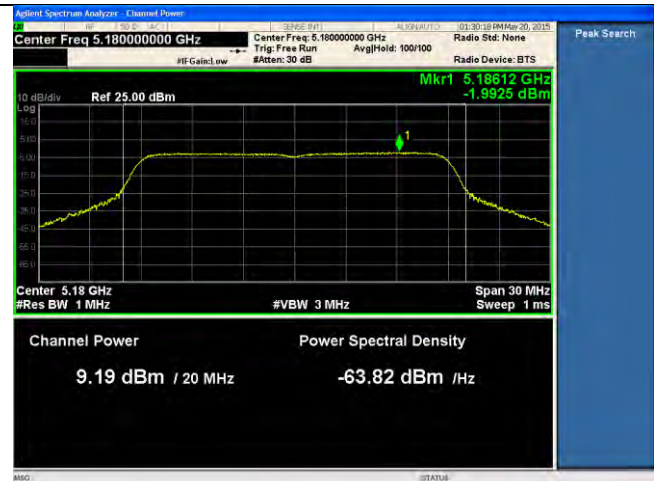
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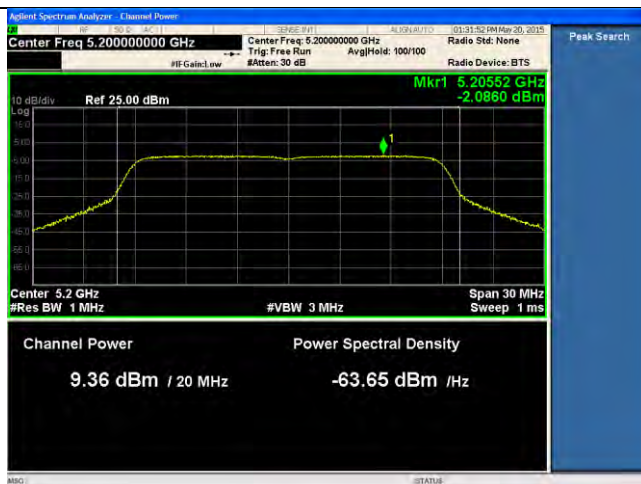
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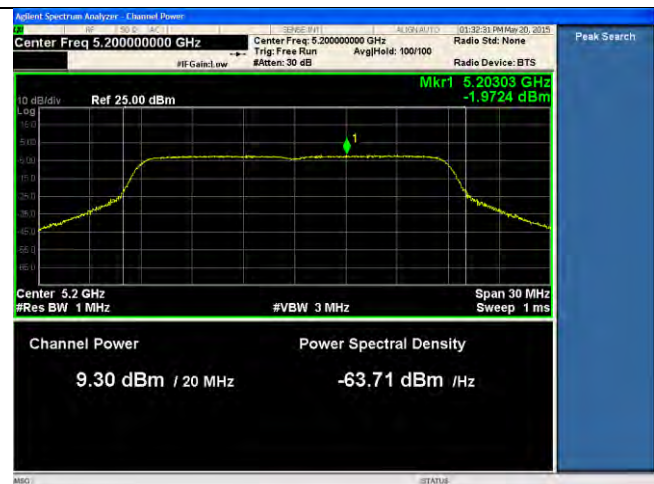
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21dBi ANT-PSD-802.11n-HT20-5180M-chain2



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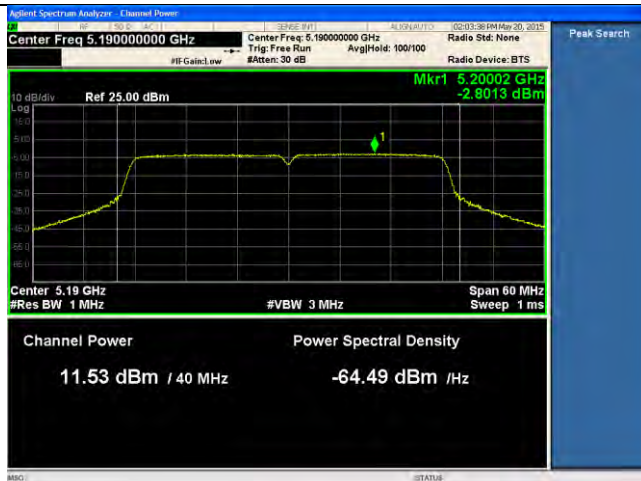
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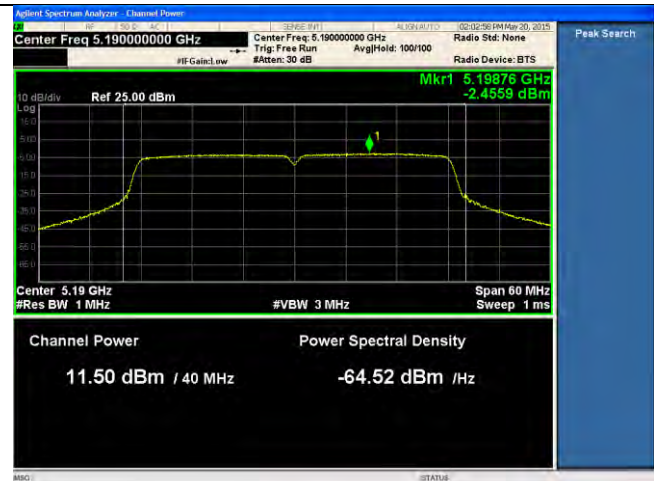
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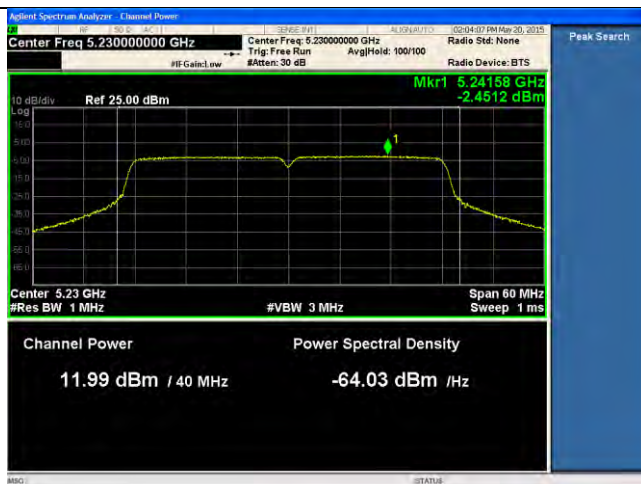
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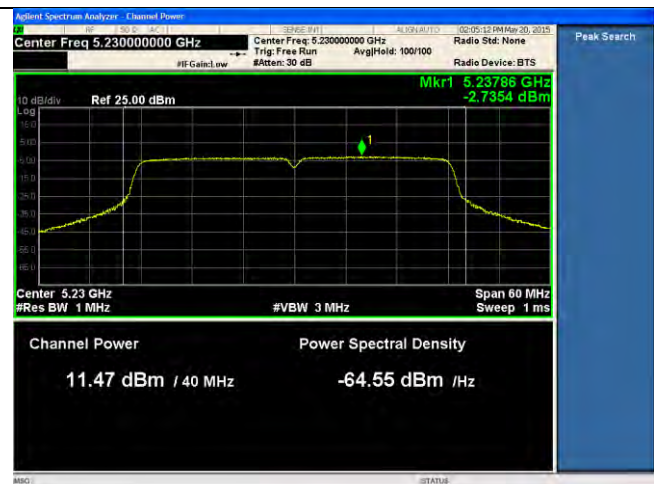
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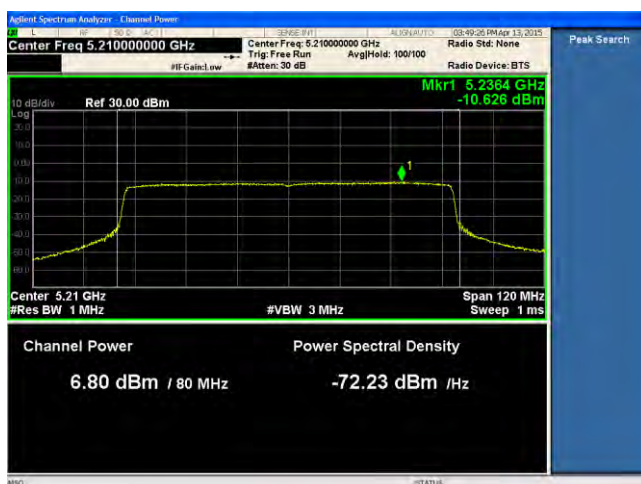
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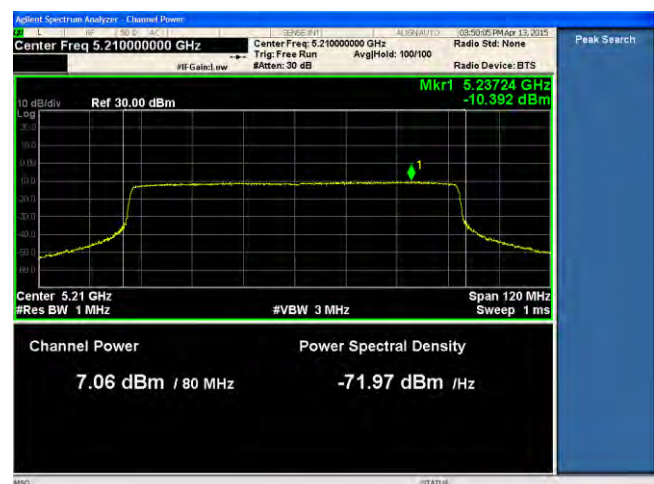
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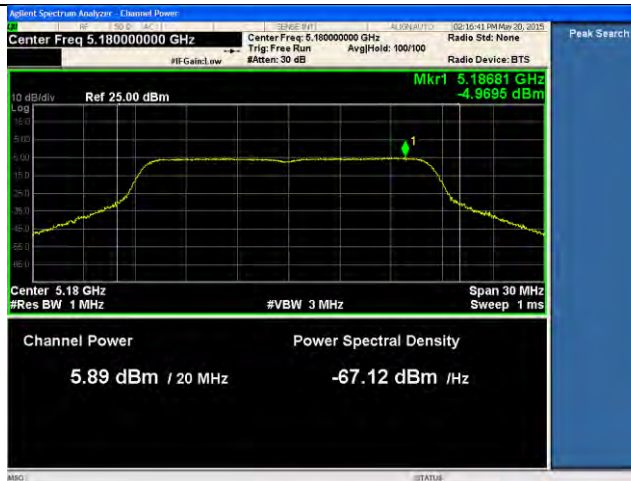
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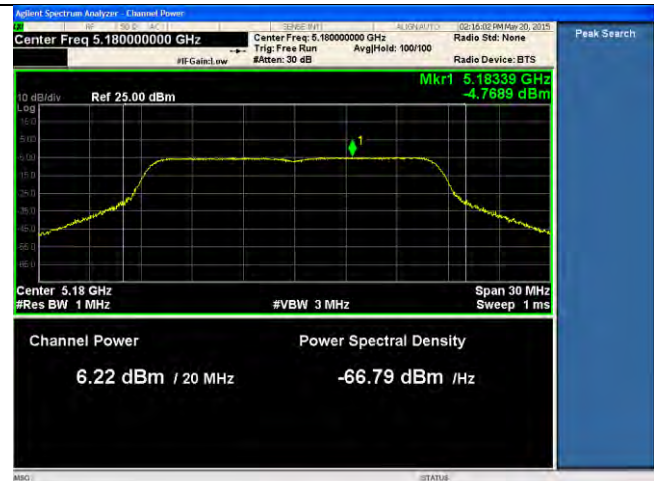
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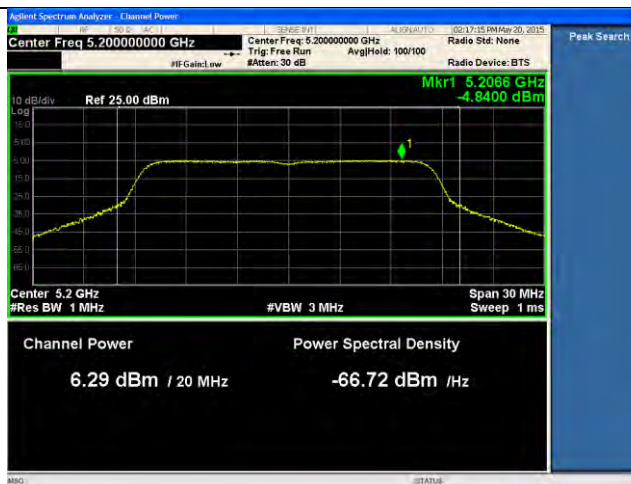
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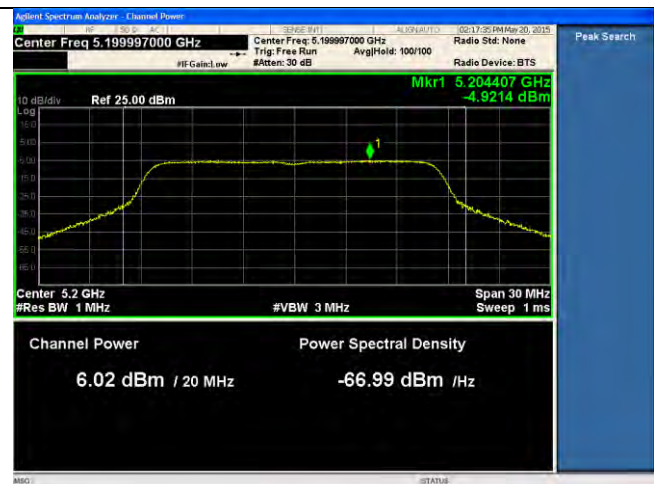
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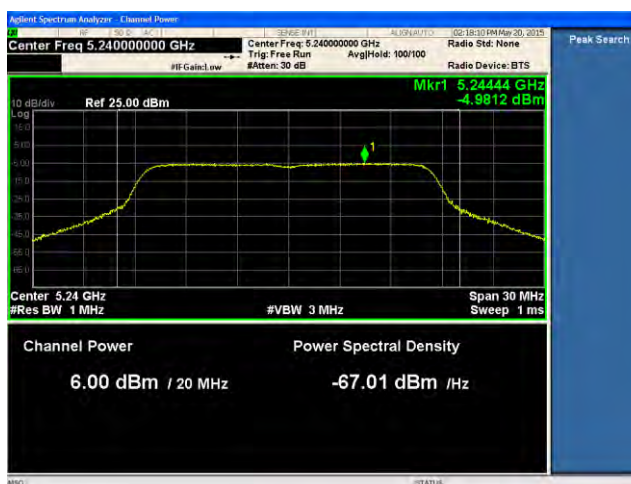
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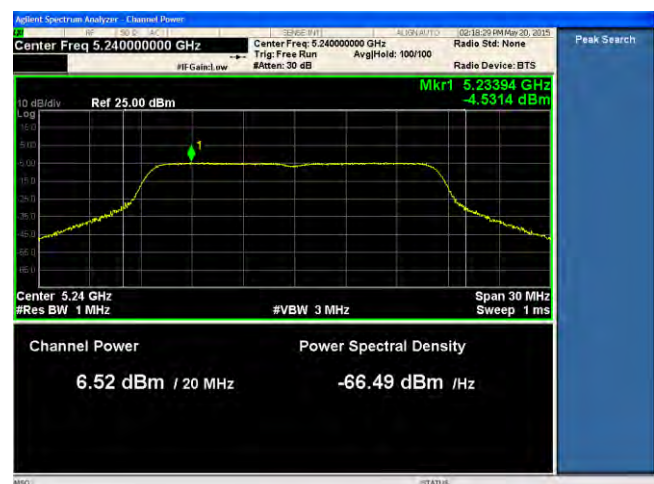
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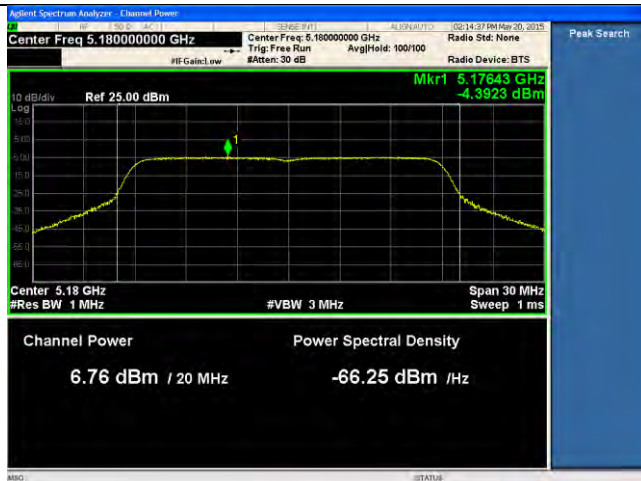
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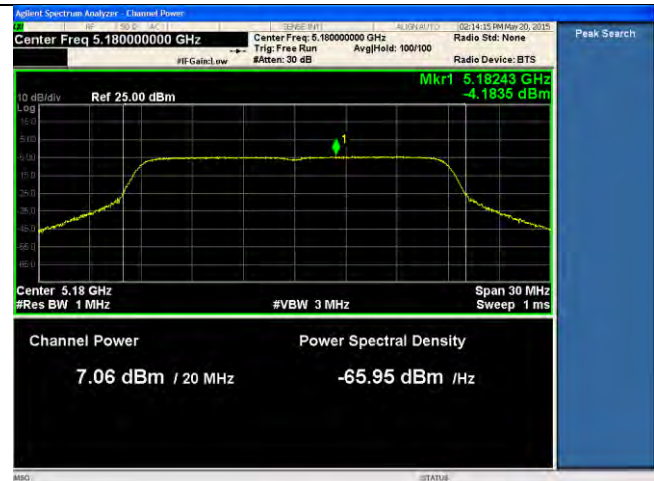
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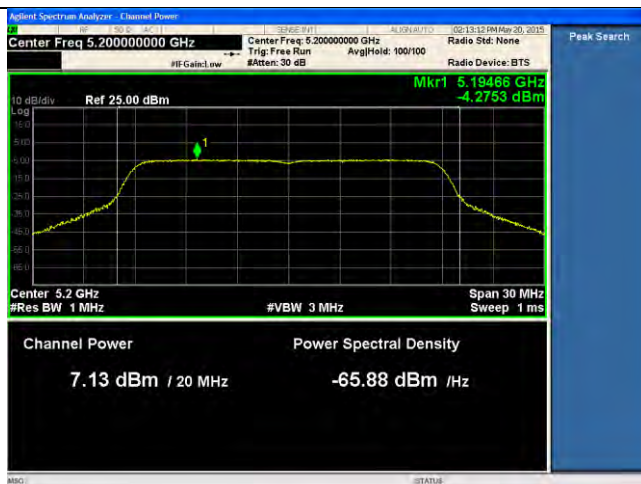
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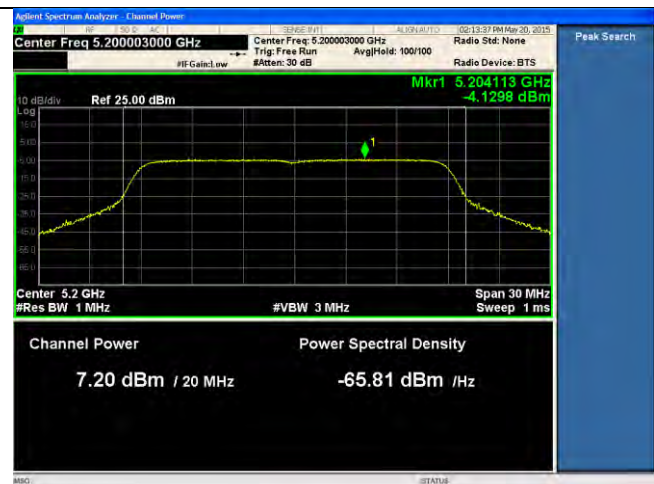
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24dBi ANT-PSD-802.11n-HT20-5180M-chain2



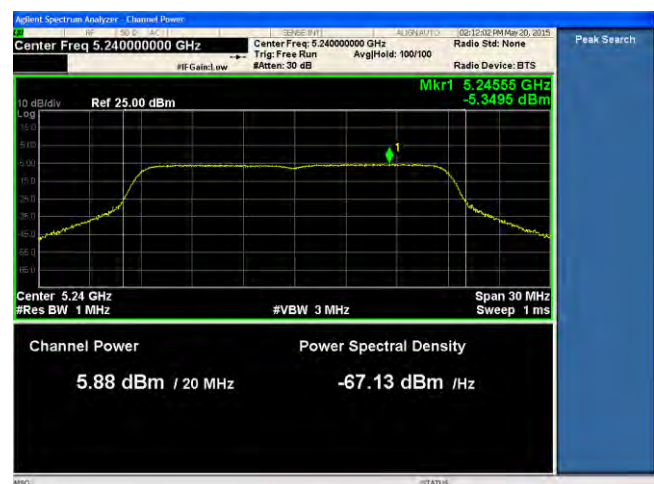
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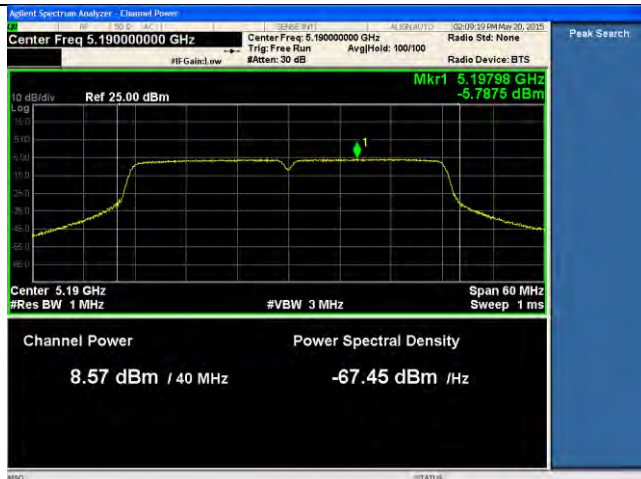
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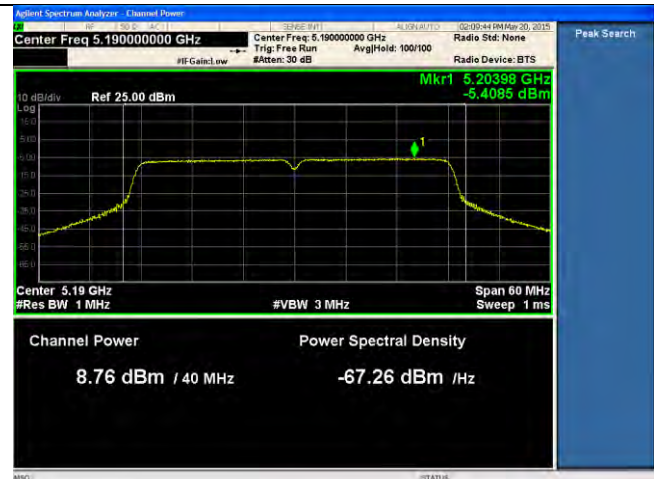
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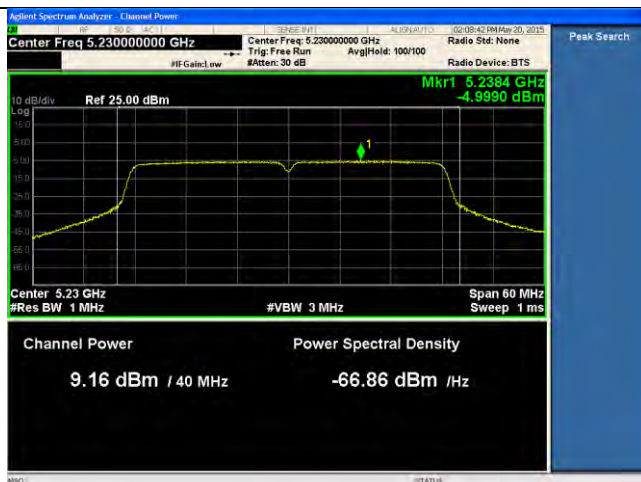
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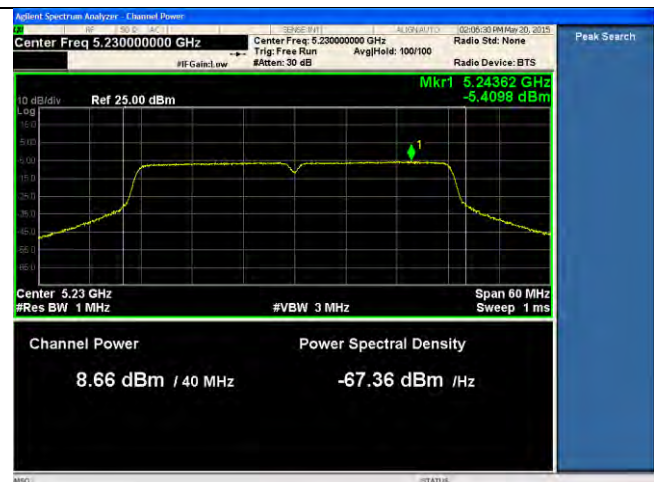
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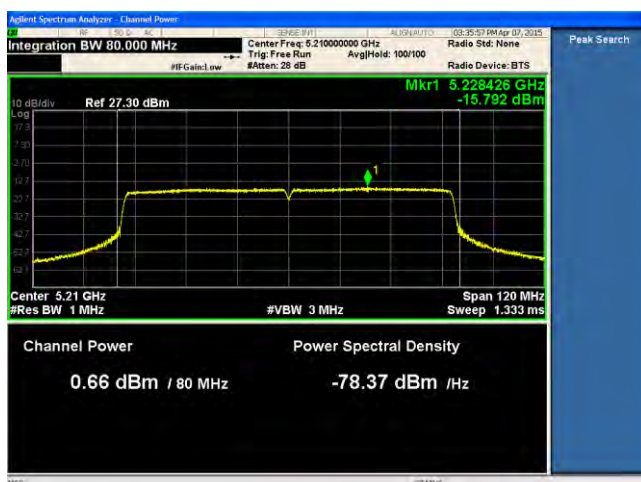
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24dBi ANT-PSD-802.11n-HT40-5230M-chain1



24dBi ANT-PSD-802.11n-HT40-5230M-chain2



24dBi ANT-PSD-802.11ac -5210M-chain1



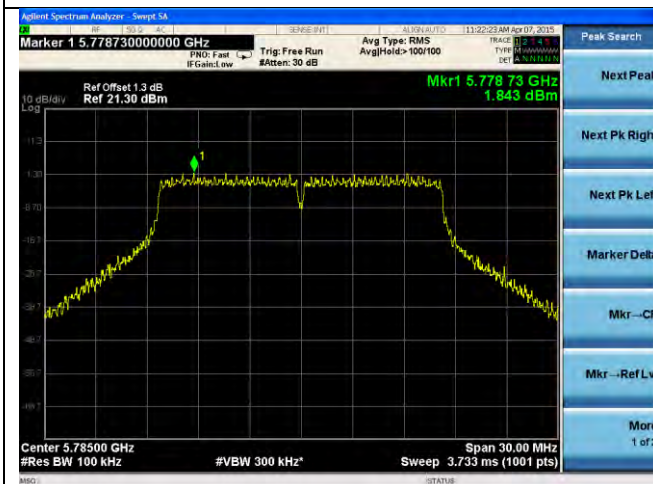
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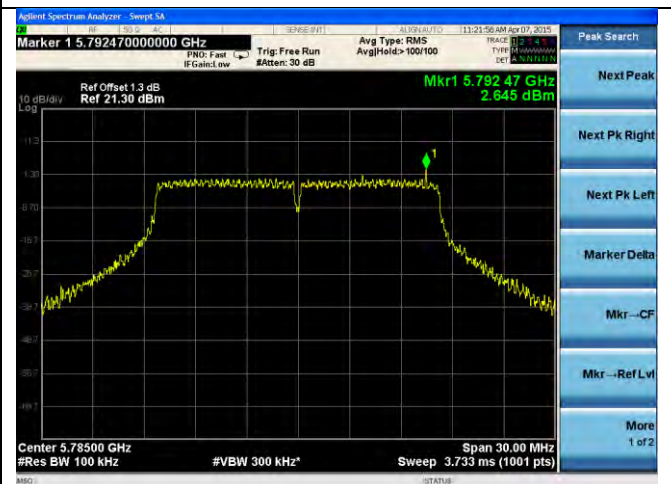
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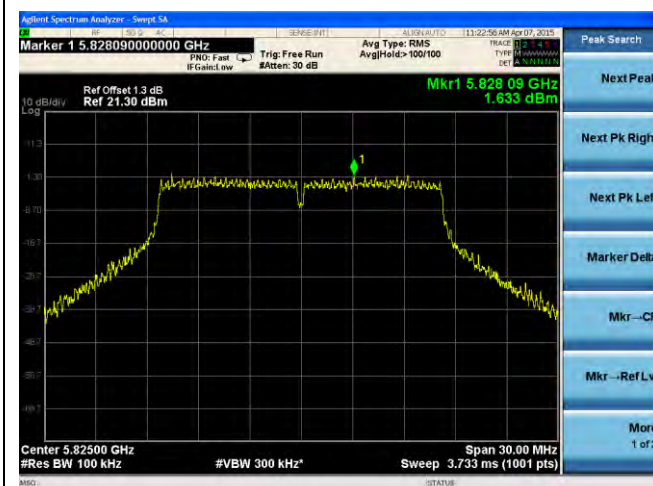
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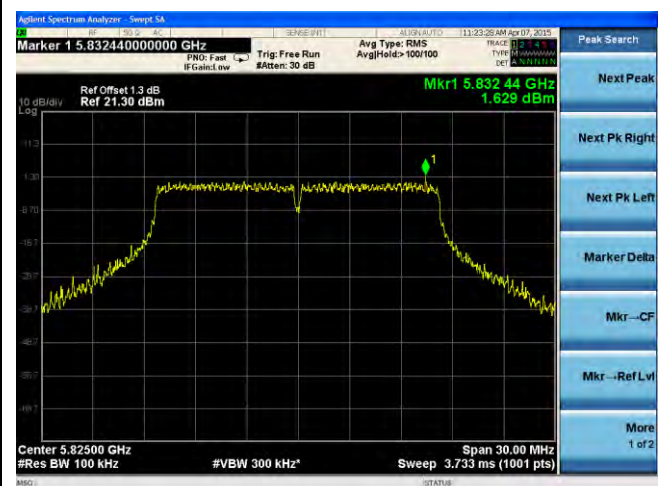
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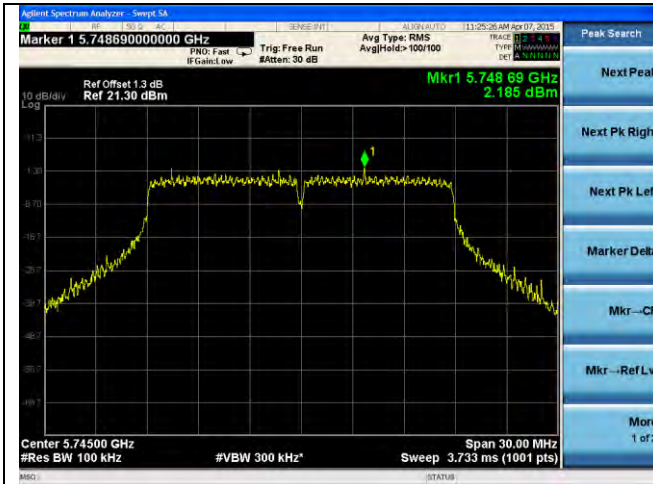
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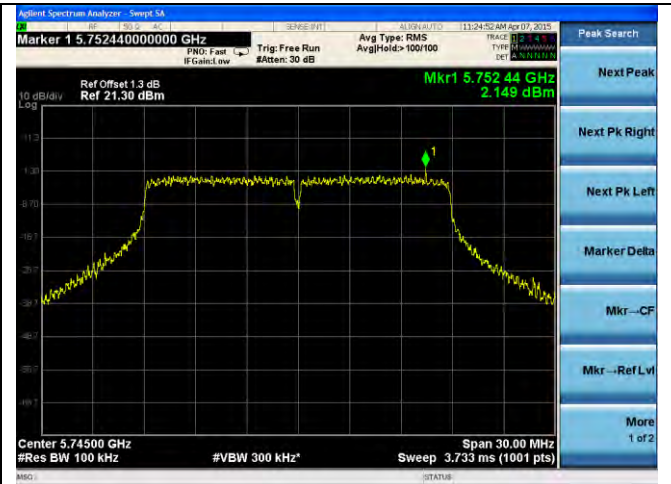
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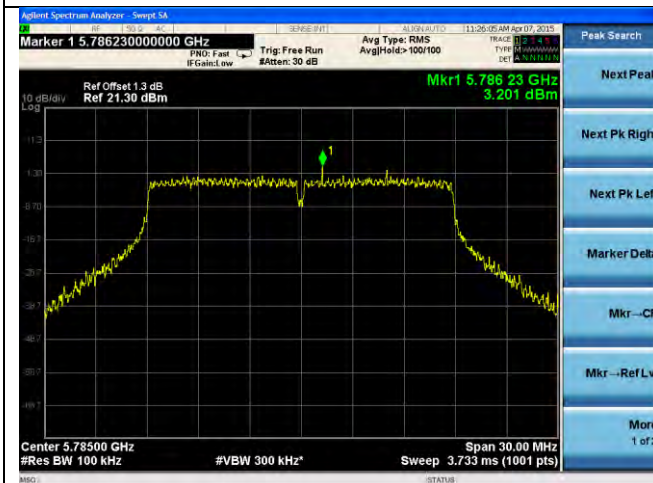
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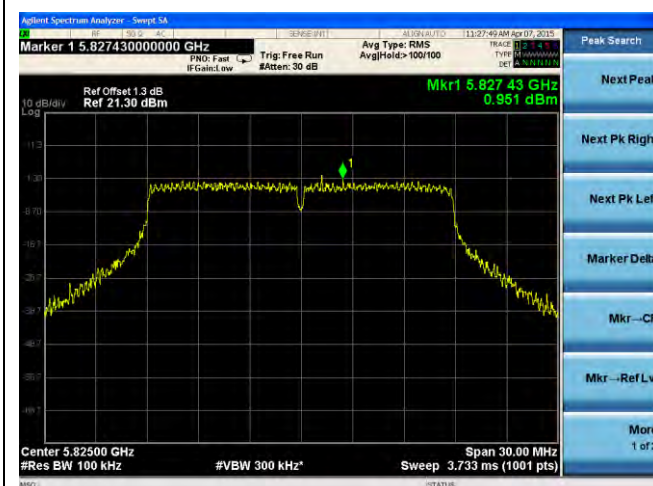
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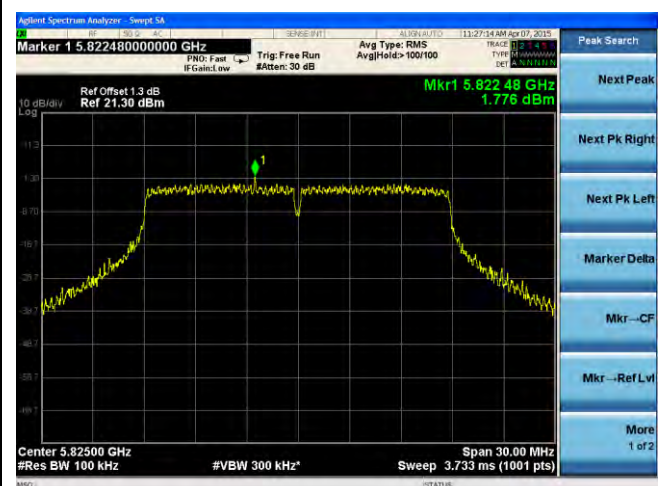
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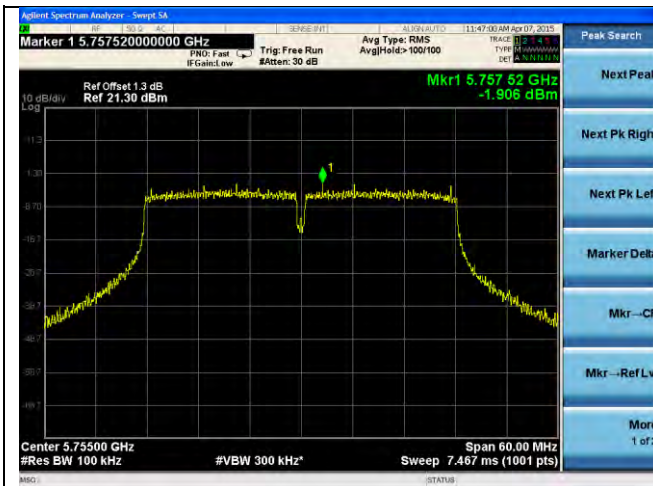
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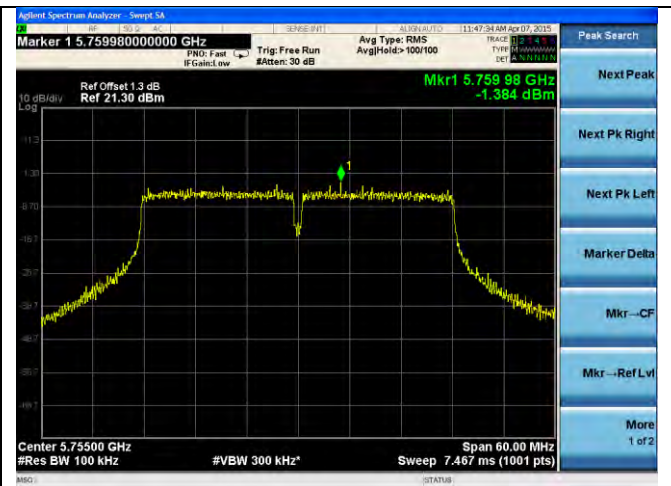
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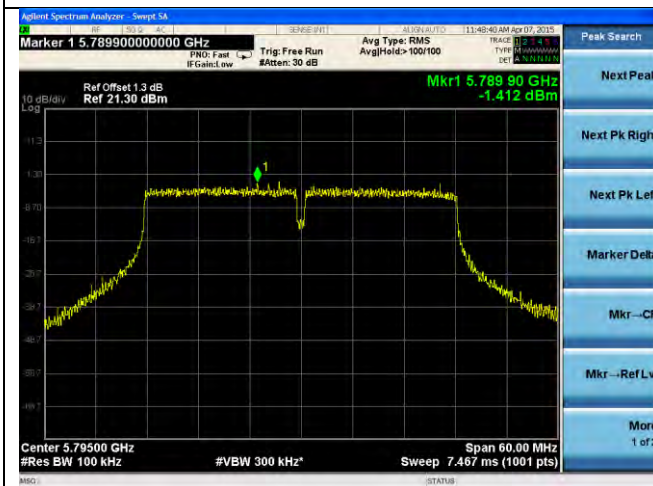
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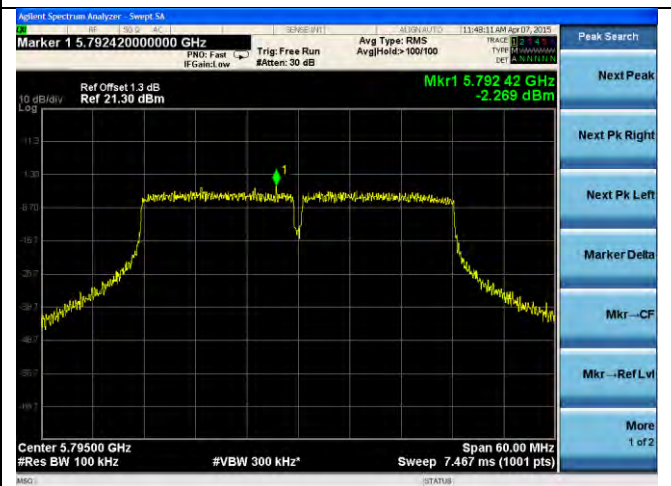
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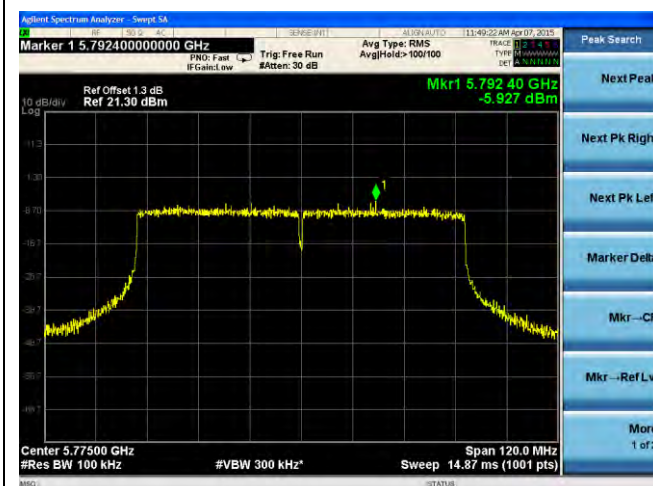
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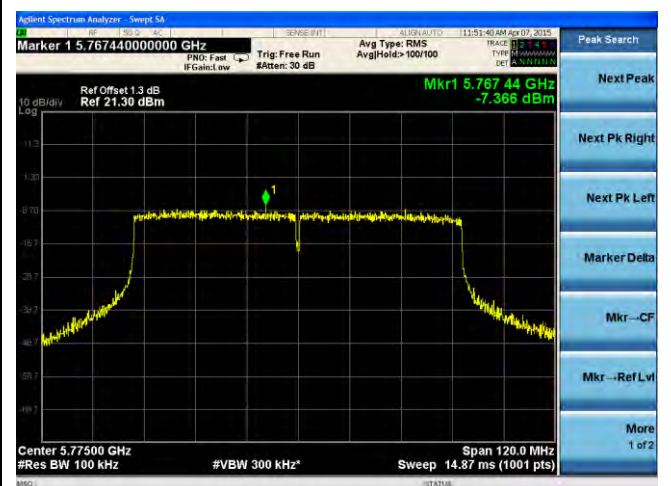
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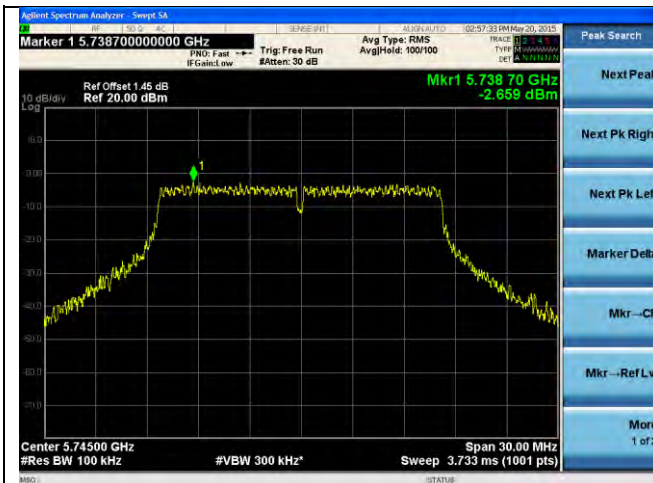
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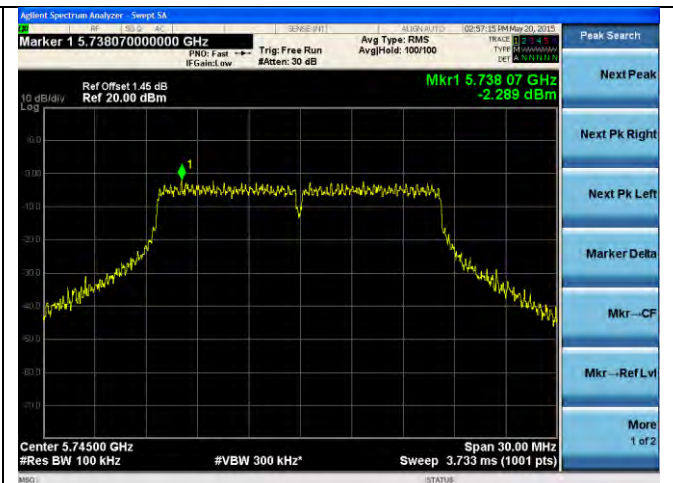
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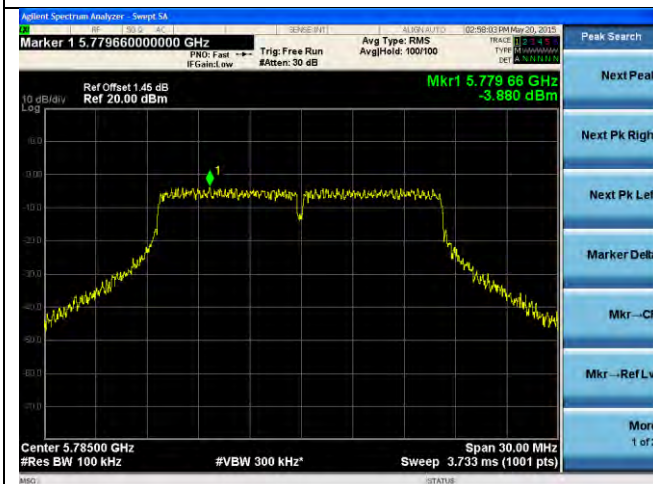
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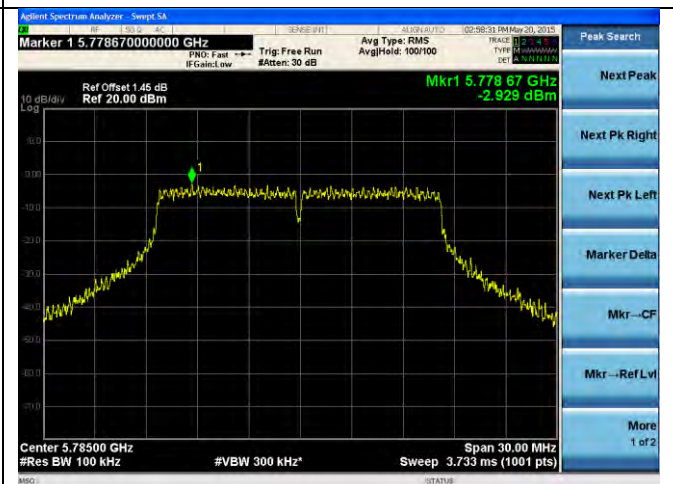
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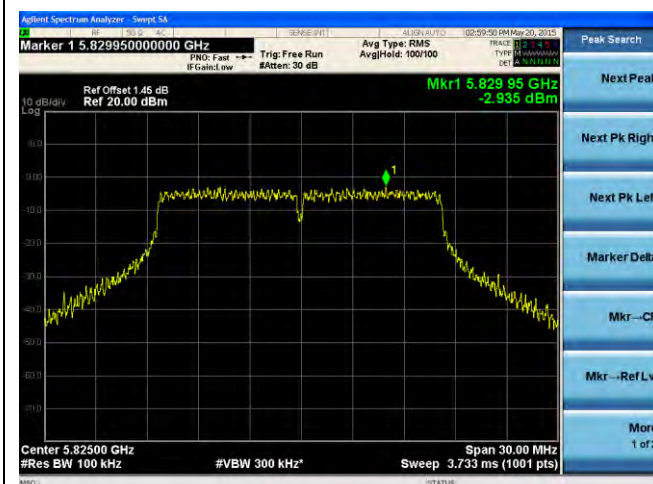
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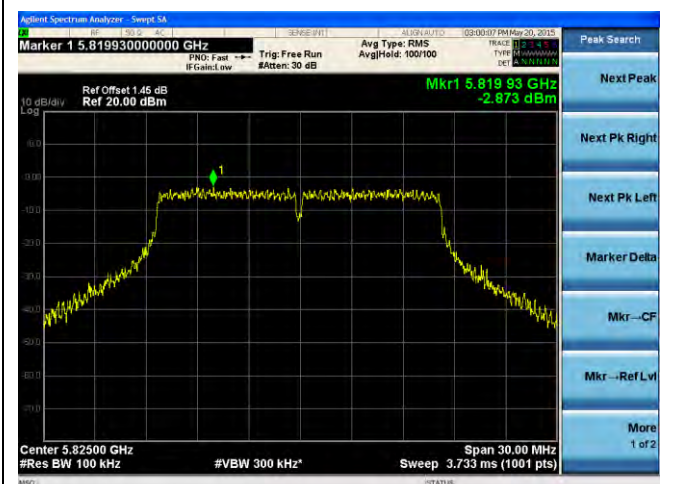
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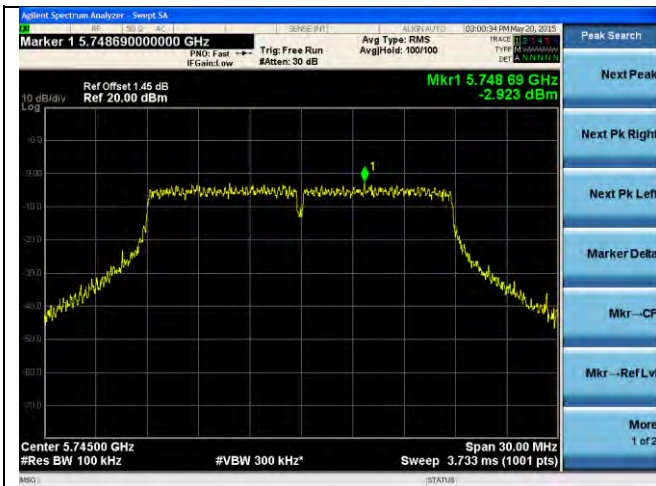
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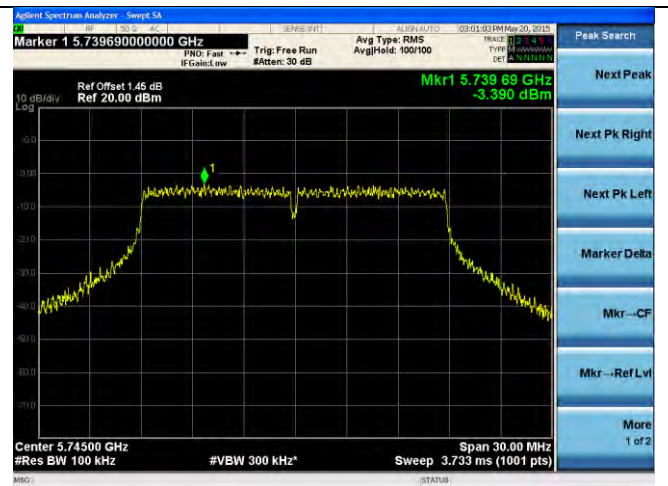
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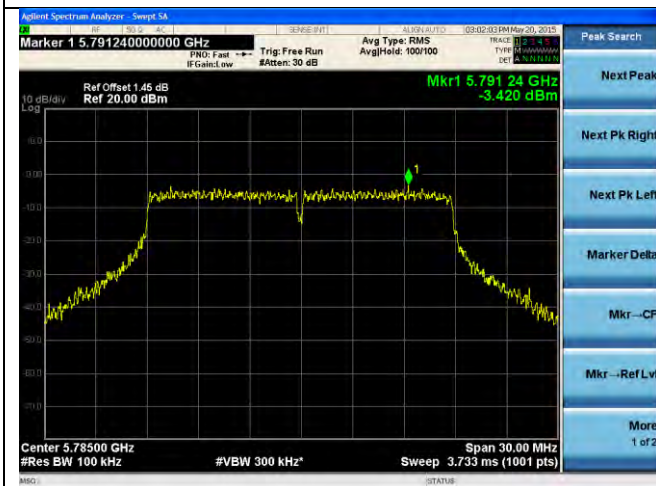
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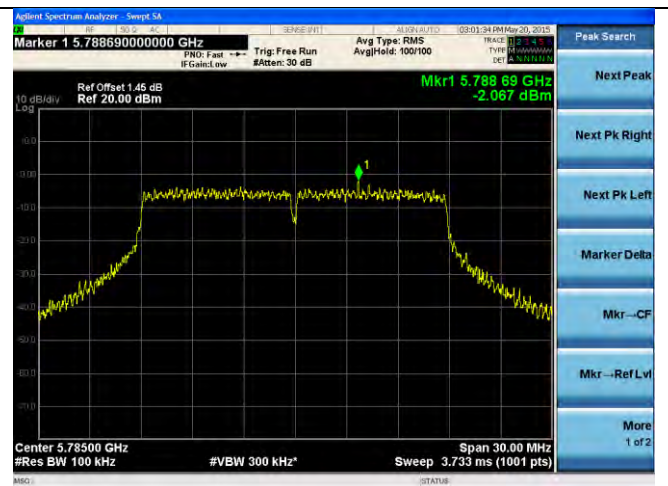
21dB ANT-PSD-802.11n-HT20-5745M-chain1



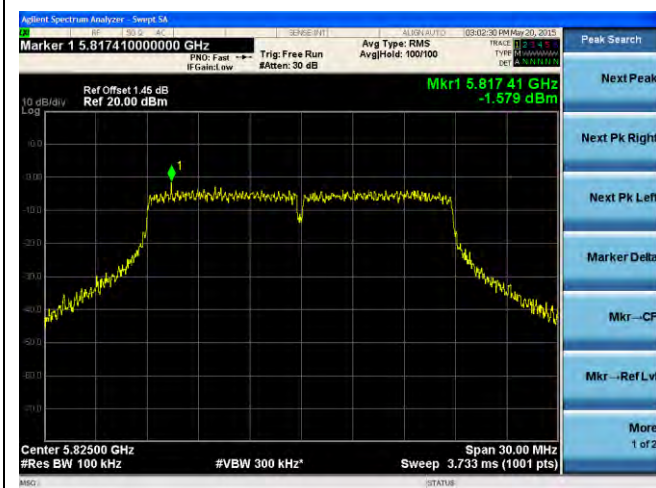
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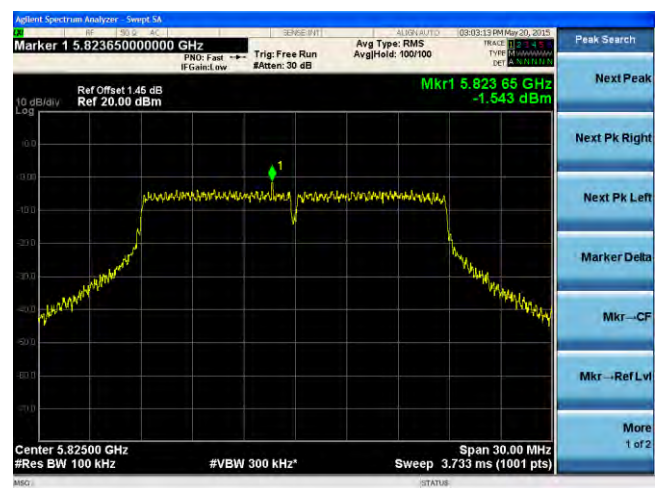
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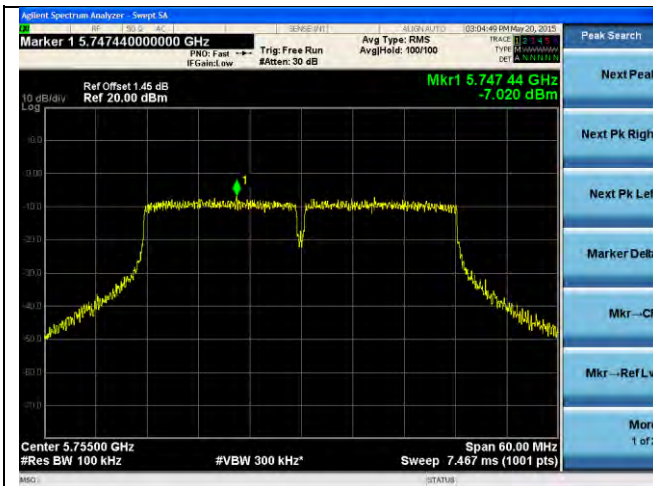
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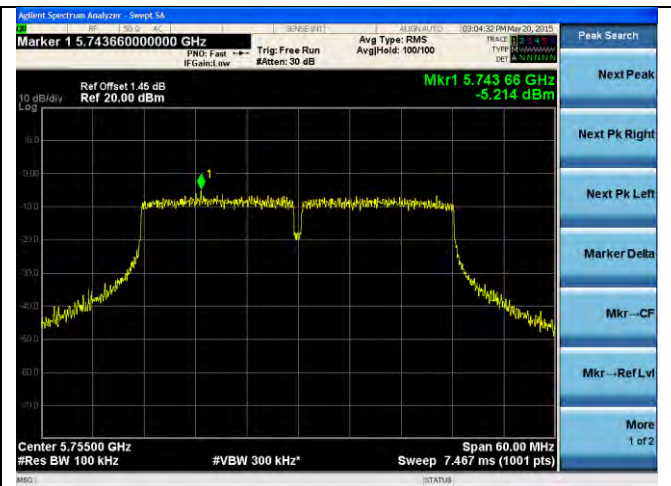
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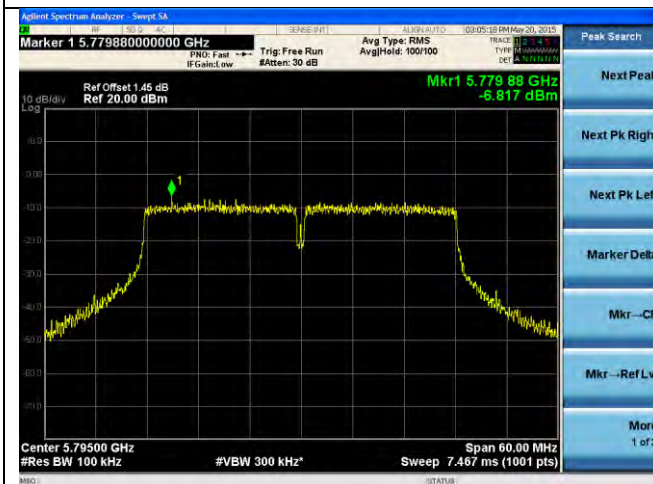
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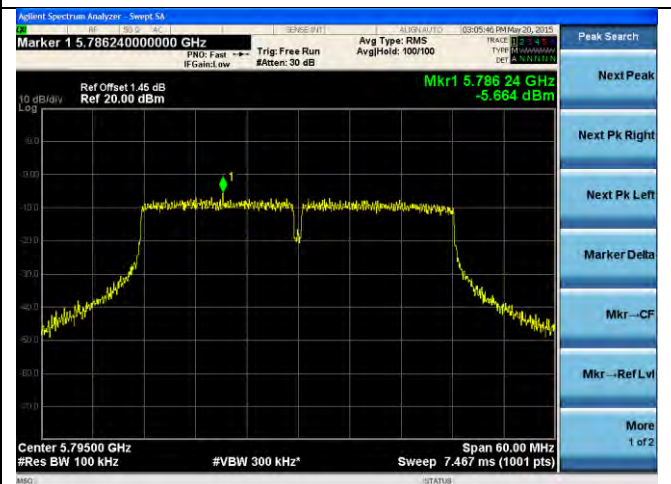
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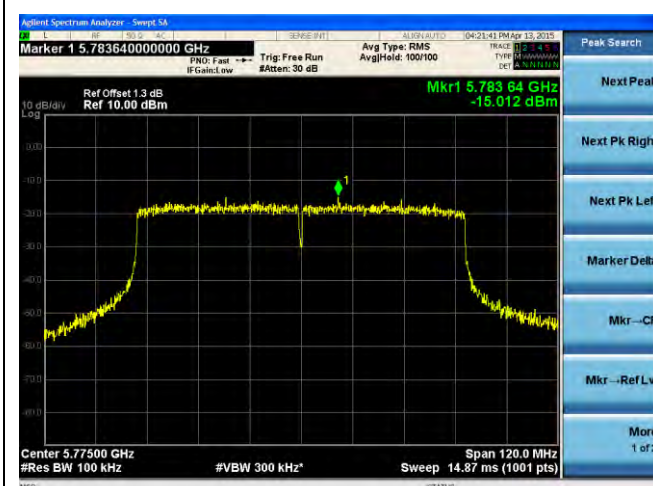
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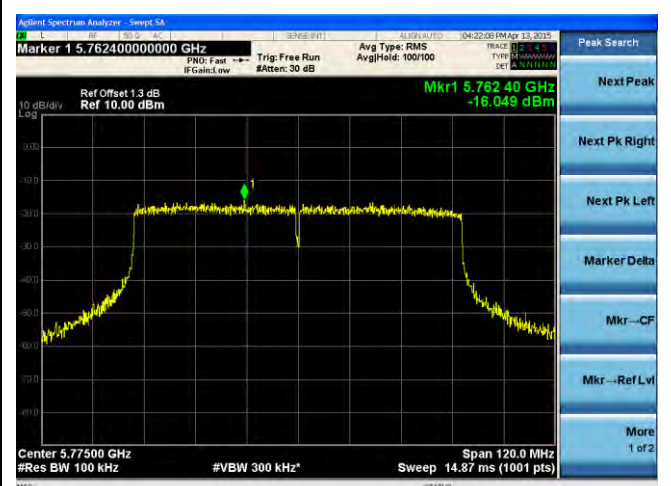
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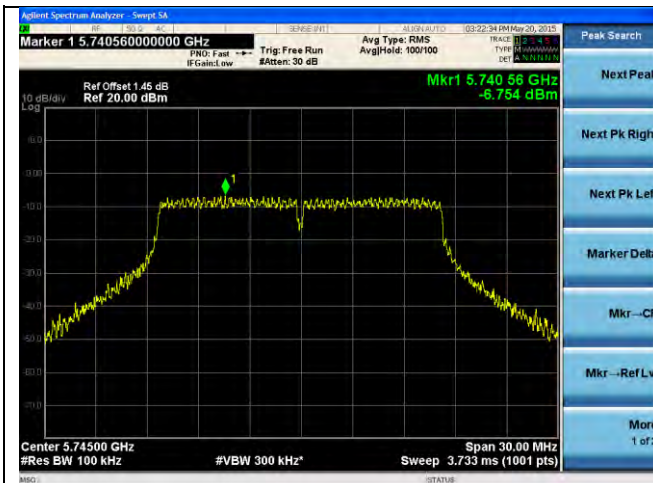
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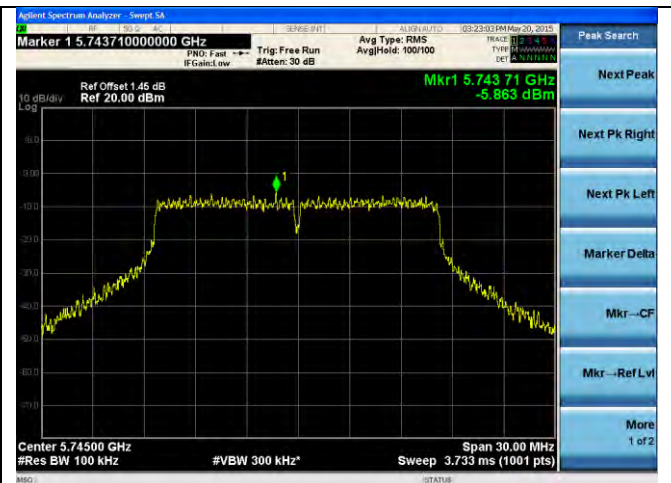
21dBi ANT-PSD-802.11ac -5775M-chain1



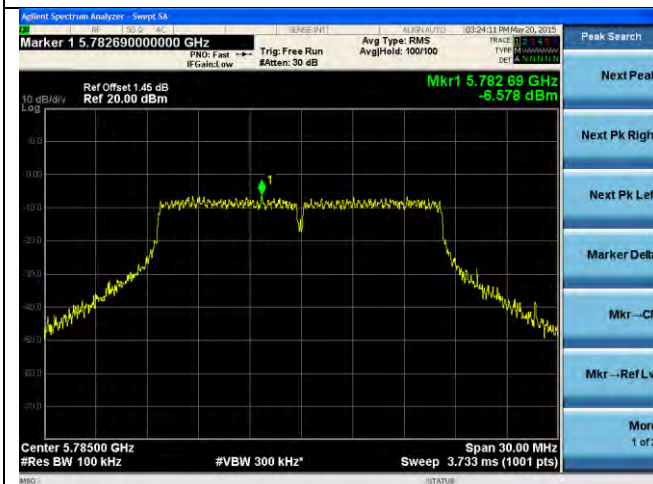
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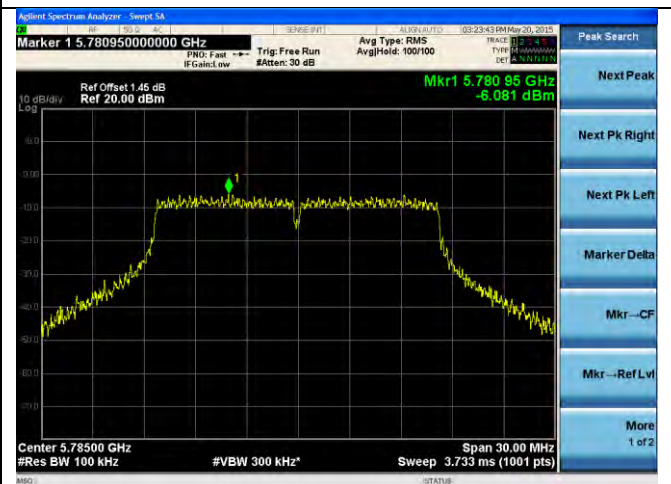
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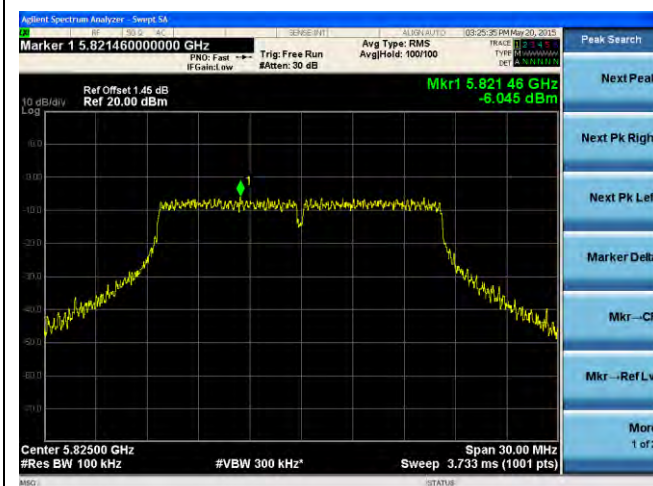
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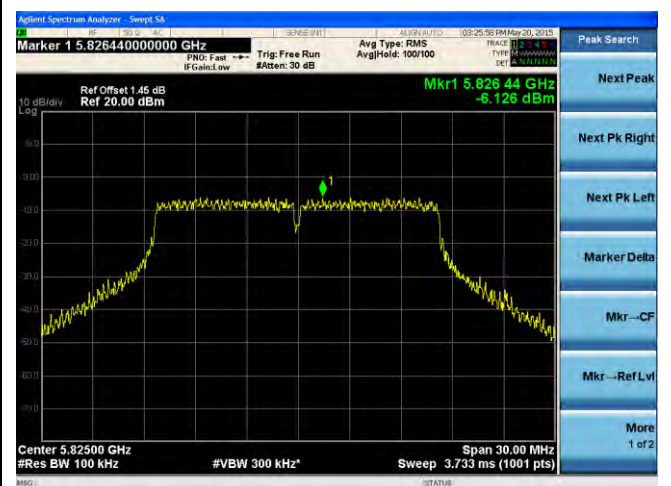
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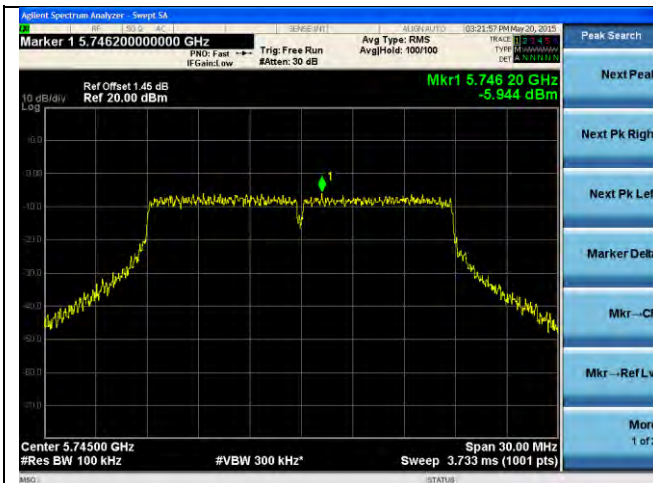
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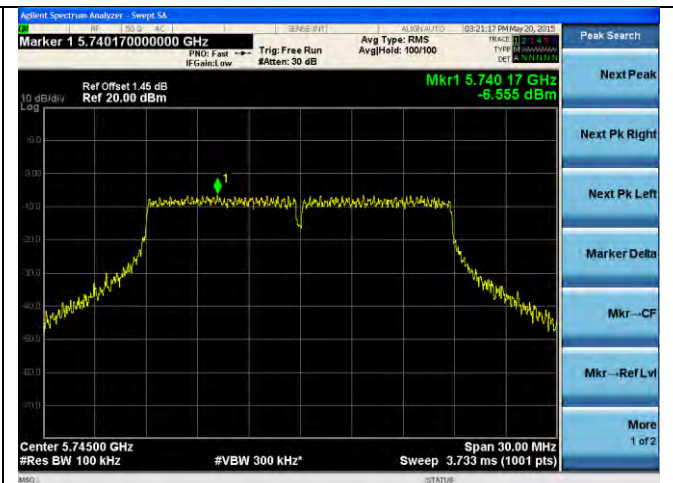
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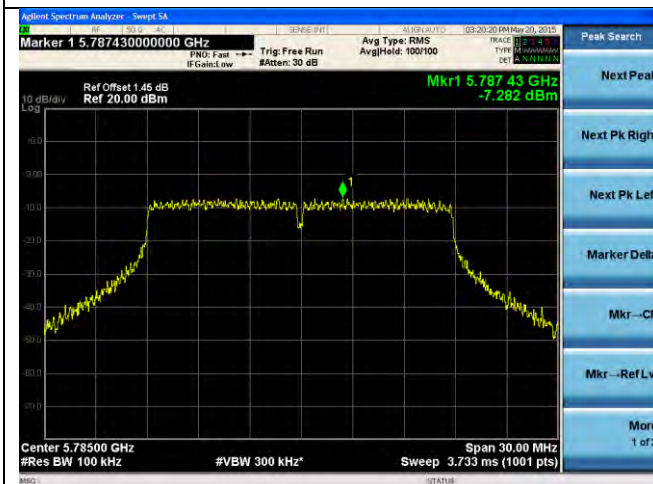
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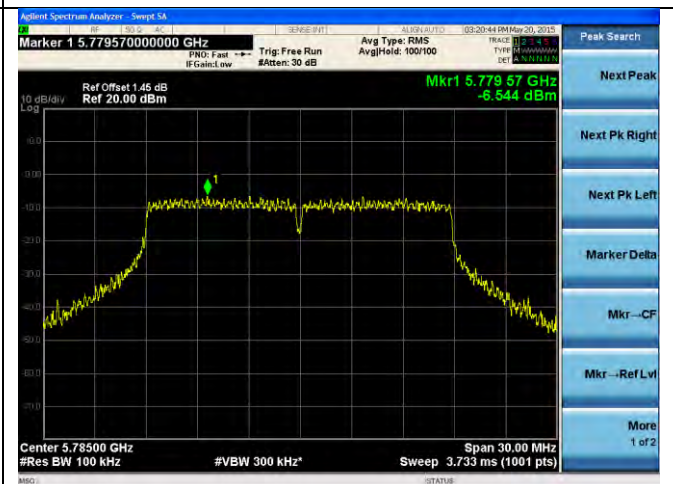
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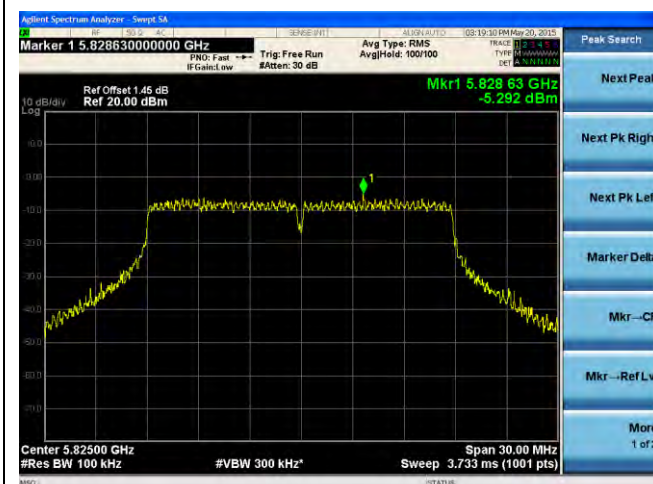
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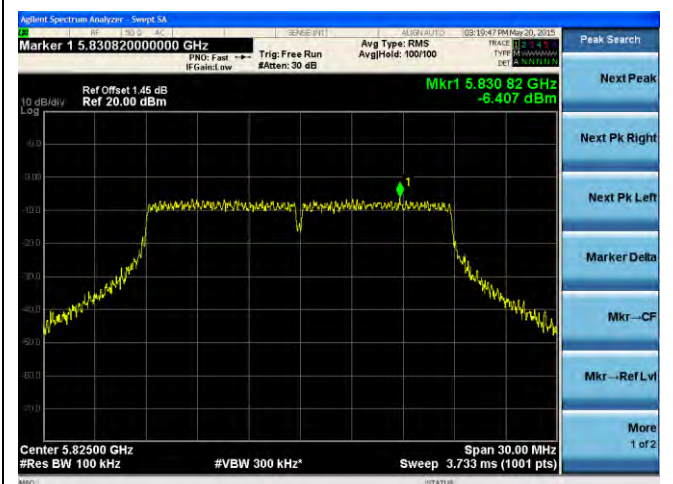
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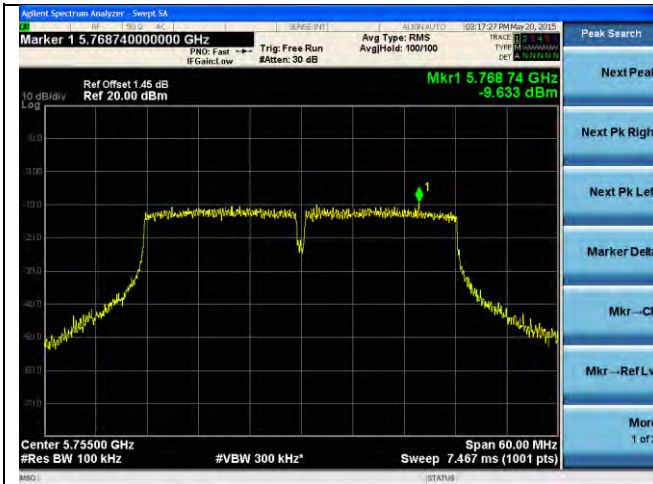
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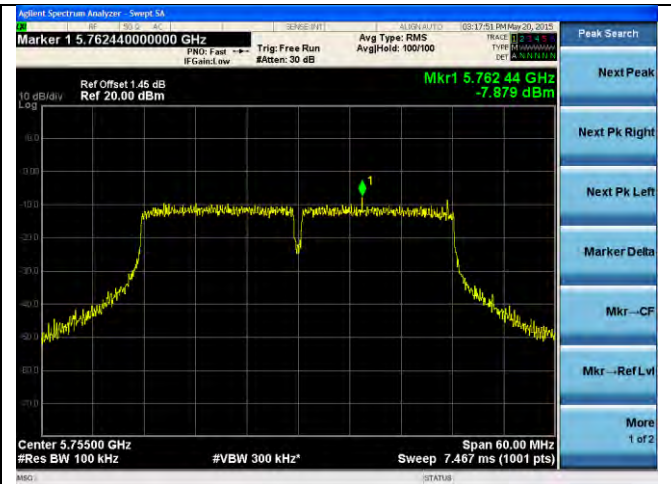
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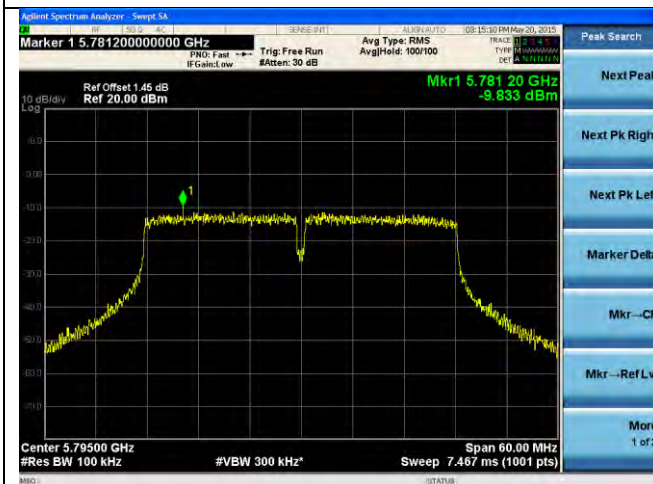
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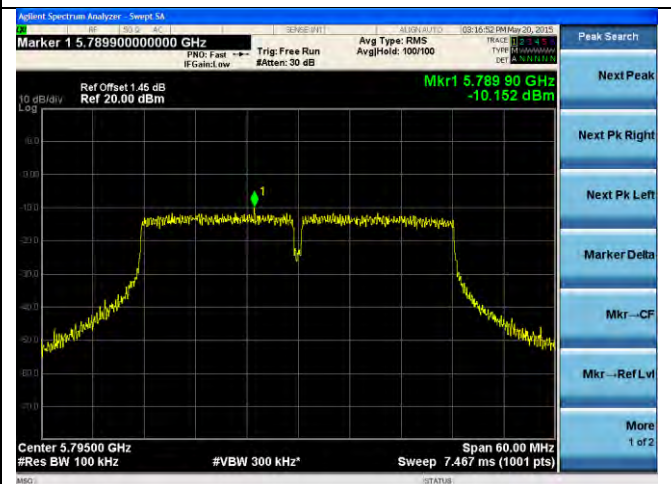
24dB ANT-PSD-802.11n-HT40-5755M-chain1



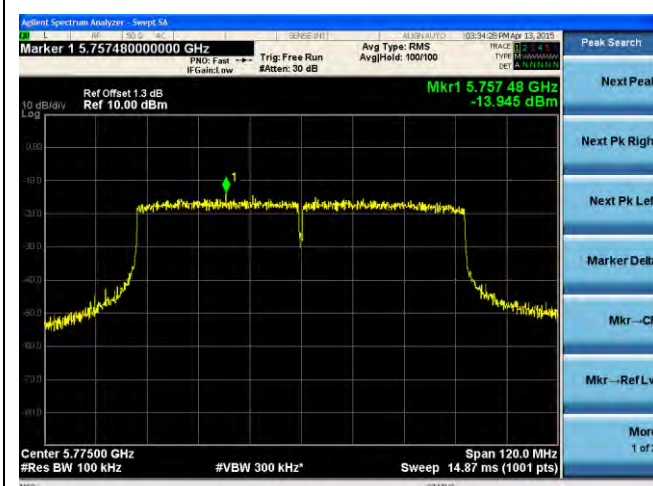
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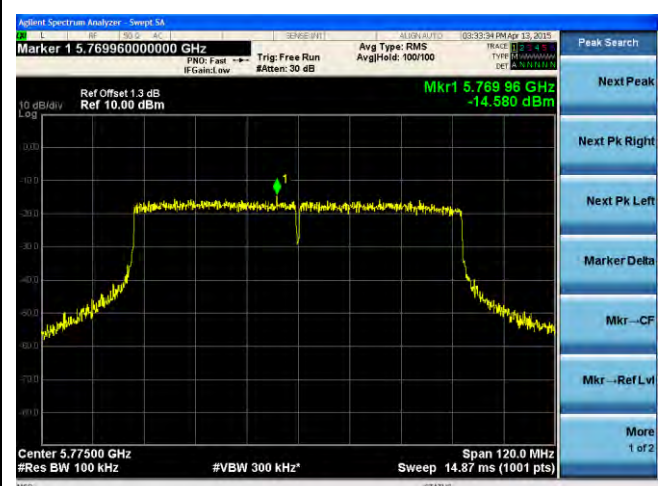
24dB ANT-PSD-802.11n-HT40-5795M-chain1



24dB ANT-PSD-802.11n-HT40-5795M-chain2



24dB ANT-PSD-802.11ac -5775M-chain1



24dB ANT-PSD-802.11ac -5775M-chain2

Annex A. TEST INSTRUMENT

Instrument	Model	Serial #	Cal Cycle	Cal Due	In use
Conducted Emissions					
Spectrum Analyzer	N9010A	MY50210206	1 Year	8/13/2015	☒
Signal Analyzer	FSIQ7	825555/013	1 Year	05/31/2015	☒
V-LISN (150 kHz – 30 MHz)	NNLK 8129	8129-190	1 Year	08/11/2015	☒
LISN (9 kHz – 30 MHz)	MN2050B	1018	1 Year	07/31/2015	☒
TLISN	ISN T800	30814	1 Year	08/08/2015	☒
Hygro Hermograph	ST-50	HE01-000092	1 Year	05/25/2015	☒
Radiated Emissions					
EMI Test Receiver	ESIB 40	100179	1 Year	05/24/2015	☒
Antenna - Biconlog (30 MHz – 2 GHz)	JB1	A030702	1 Year	08/12/2015	☒
DoubleRidged Waveguide Horn Antenna (1-18 GHz)	3115	10SL0059	1 Year	08/11/2015	☒
Horn Antenna (18-40 GHz)	AH-840	101013	1 Year	08/11/2015	☒
RF Pre-Amplifier	LPA-6-30	11140711	1 Year	02/19/2016	☒
Microwave Preamplifier (18-40 GHz)	PA-840	181251	1 Year	02/19/2016	☒
10 Meters SAC	10M	N/A	1 Year	09/05/2015	☒
Hygro Hermograph	ST-50	HE01-000092	1 Year	05/25/2015	☒
RF Conducted Measurement					
Spectrum Analyzer	N9010A	MY50210206	1 Year	8/13/2015	☒

Annex B. SIEMIC Accreditation

Accreditations	Document	Scope / Remark
ISO 17025 (A2LA)		Please see the documents for the detailed scope
ISO Guide 65 (A2LA)		Please see the documents for the detailed scope
TCB Designation		A1 , A2 , A3 , A4 , B1 , B2 , B3 , B4 , C
FCC DoC Accreditation		FCC Declaration of Conformity Accreditation
FCC Site Registration		3 meter site
FCC Site Registration		10 meter site
IC Site Registration		3 meter site
IC Site Registration		10 meter site
EU NB		Radio & Telecommunications Terminal Equipment: EN45001 – EN ISO/IEC 17025
		Electromagnetic Compatibility: EN45001 – EN ISO/IEC 17025
Singapore iDA CB(Certification Body)		Phase I , Phase II
Vietnam MIC CAB Accreditation		Please see the document for the detailed scope
Hong Kong OFCA		(Phase II) OFCA Foreign Certification Body for Radio and Telecom
		(Phase I) Conformity Assessment Body for Radio and Telecom
Industry Canada CAB		Radio: Scope A – All Radio Standard Specification in Category I
		Telecom: CS-03 Part I, II, V, VI, VII, VIII

Japan Recognized Certification Body Designation		Radio: A1. Terminal equipment for purpose of calling Telecom: B1. Specified radio equipment specified in Article 38-2, Paragraph 1, Item 1 of the Radio Law
Korea CAB Accreditation		EMI: KCC Notice 2008-39, RRL Notice 2008-3: CA Procedures for EMI KN22: Test Method for EMI EMS: KCC Notice 2008-38, RRL Notice 2008-4: CA Procedures for EMS KN24, KN61000-4-2, -4-3, -4-4, -4-5, -4-6, -4-8, -4-11: Test Method for EMS Radio: RRL Notice 2008-26, RRL Notice 2008-2, RRL Notice 2008-10, RRL Notice 2007-49, RRL Notice 2007-20, RRL Notice 2007-21, RRL Notice 2007-80, RRL Notice 2004-68 Telecom: President Notice 20664, RRL Notice 2007-30, RRL Notice 2008-7 with attachments 1, 3, 5, 6; President Notice 20664, RRL Notice 2008-7 with attachment 4
Taiwan NCC CAB Recognition		LP0002, PSTN01, ADSL01, ID0002, IS6100, CNS14336, PLMN07, PLMN01, PLMN08
Taiwan BSMI CAB Recognition		CNS 13438
Japan VCCI		R-3083: Radiation 3 meter site C-3421: Main Ports Conducted Interference Measurement T-1597: Telecommunication Ports Conducted Interference Measurement
Australia CAB Recognition		EMC: AS/NZS CISPR 11, AS/NZS CISPR 14.1, AS/NZS CISPR22, AS/NZS 61000.6.3, AS/NZS 61000.6.4 Radio communications: AS/NZS 4281, AS/NZS 4268, AS/NZS 4280.1, AS/NZS 4280.2, AS/NZS 4295, AS/NZS 4582, AS/NZS 4583, AS/NZS 4769.1, AS/NZS 4769.2, AS/NZS 4770, AS/NZS 4771 Telecommunications: AS/ACIF S002:05, AS/ACIF S003:06, AS/ACIF S004:06 AS/ACIF S006:01, AS/ACIF S016:01, AS/ACIF S031:01, AS/ACIF S038:01, AS/ACIF S040:01, AS/ACIF S041:05, AS/ACIF S043.2:06, AS/ACIF S60950.1
Australia NATA Recognition		AS/ACIF S002, AS/ACIF S003, AS/ACIF S004, AS/ACIF S006, AS/ACIF S016, AS/ACIF S031, AS/ACIF S038, AS/ACIF S040, AS/ACIF S041, AS/ACIF S043.2